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A Report of the Electric Power Survey Committee of the EDISON ELECTRIC INSTITUTE

# 1984 ELECTRIC POWER ANNUAL REPORT

HISTORY: 1980-84 □ PROJECTIONS 1985-94

# FEATURES OF THE ANNUAL REPORT

- The 1983 Electric Power Annual Report replaced and combined the features of what would have been the 1983 Year-End Electric Power Survey and the 1984 Annual Electric Power Survey. Following the new format introduced last year, historical and projected data for capability, peak load, and energy requirements are shown in separate sections in this 1984 Electric Power Annual Report.

- The data in this report cover only the contiguous U.S. portions of NERC, i.e., the lower forty-eight states. The electric utility power systems of the United States are normally operated as three separate interconnected areas: the Eastern Interconnection, the Electric Reliability Council of Texas (ERCOT), and the Western Systems Coordinating Council (WSCC). Generating capacity available in one of these areas is not usually available to any other area. Also, generating capacity in one of the interconnected areas may not be available to serve load throughout that area due to various internal constraints.

- Regional and national values in this report do not include the capabilities, peak loads, or energy requirements of isolated electric power installations either serving local areas or owned by industries or institutions.

- This report maintains the new percent margin definition that divides the difference between the capability and peak load by the capability. This new calculation has been designated "Percent Capacity Margin" and differs from the "Percent Capability Margins" published in Electric Power Survey reports prior to 1983—values that had been derived by dividing the difference between the capability and peak load by the peak load (also often referred to as "Percent Reserve Margin").

- In conformity with NERC's recent practice, projected peak load values are no longer reduced by the amount of interruptible contracts.

# A REPORT OF THE ELECTRIC POWER SURVEY COMMITTEE OF THE EDISON ELECTRIC INSTITUTE

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Siemens Corporation
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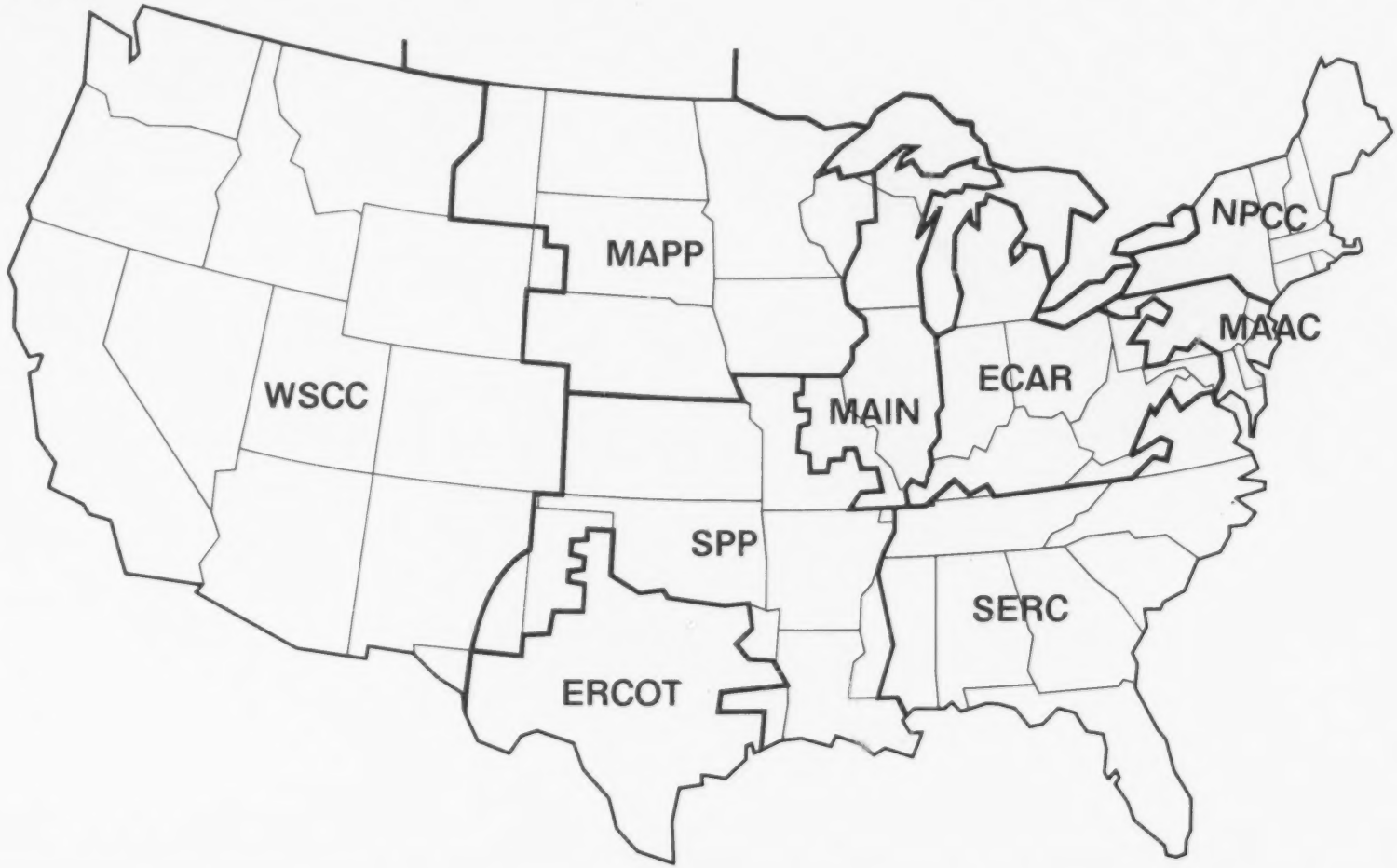
Utility Power Corporation

## Figure 1/U.S. REGIONS OF THE NORTH AMERICAN ELECTRIC RELIABILITY COUNCIL

**IDENTIFICATION OF RELIABILITY COUNCILS:**

**ECAR**—East Central Area Reliability Coordination Agreement
**ERCOT**—Electric Reliability Council of Texas
**MAAC**—Mid-Atlantic Area Council
**MAIN**—Mid-America Interpool Network
**MAPP**—Mid-continent Area Power Pool
**NPCC**—Northeast Power Coordinating Council
**SERC**—Southeastern Electric Reliability Council
**SPP**—Southwest Power Pool
**WSCC**—Western Systems Coordinating Council

The electric utility systems of the United States are normally operated as three separate interconnected areas: the Eastern Interconnection, the Electric Reliability Council of Texas (ERCOT), and the Western Systems Coordinating Council (WSCC). Generating capacity available in one of these areas is not usually available to any other area. Also, generating capacity in one of the interconnected areas may not be available to serve load throughout that area due to various internal constraints.



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# FOREWORD

Last year the 1983 Electric Power Annual Report replaced and combined the features of what would have been the 1983 Year-End and the 1984 Annual Electric Power Surveys. This second issue in the new format presents information concerning the electric power supply, expansion of electric generating facilities, and the manufacture of heavy electric power equipment in the United States as of the end of 1984.

The report is divided into three parts. Part I covers the history of electric power supply from 1980 through 1984. Part II pertains to projected power supply values from 1985 to 1994. Part III has to do with the planned domestic manufacture and importation of heavy electric power equipment as of January 1, 1985.

The historical data from 1980 through 1984 are an accurate presentation of the peak load, capability installed to meet load, and energy requirements for these time periods. The electric power supply data shown in Parts I and II of this report are derived partly from IE-411 reports for previous years submitted to the Department of Energy, and from reports of the North American Electric Reliability Council (NERC). Historical capability values have all been revised to agree with installed capability figures provided to NERC headquarters by the reliability councils. Forecast values used herein are those compiled and validated by NERC and published in their report, ELECTRIC POWER SUPPLY AND DEMAND 1985-1994. Installed capability, peak load and percent capacity margin values shown in this report for the summer of 1984 update the preliminary actual values published in EEI's 1984 Post-Summer Electric Power Survey. In conformity with NERC's practice, projected peak load values are not reduced by the amount of interruptible contracts.

Until four years ago, Annual Electric Power Survey power supply figures had been obtained by means of questionnaires sent to the regional and subregional utility reporting entities by the Edison Electric Institute on behalf of the Electric Power Survey Committee. When the switch in data source was made in 1981, consistent NERC-published values were included back to 1979. For a discussion of the magnitude of the break between the old EEI-collected series (pre-1979) and the NERC-collected series now reformatted for publication in these annual reports, see the FOREWORD in the 1981 Annual Electric Power Survey.

Data in this report represent the total electric utility industry of the contiguous United States, including Investor-Owned systems and those of governmental agencies—Federal, Municipal and State & Local—and also Rural Electric Cooperatives.

The reported data include some industrial power installations whose operations are coordinated with the utility systems with which they are interconnected and which thereby contribute to the public supply. The data do not include any isolated industrial or institutional power installations.

Data pertaining to power system capabilities, peak loads, percent capacity margins, and energy requirements are presented for each of the nine reliability councils of NERC. Boundaries of the nine reliability councils are shown by the map in Fig. 1. The North American Electric Reliability Council encompasses essentially all utility systems in the United States and five Canadian provinces, but the data presented in this report cover only the systems in the contiguous United States.

Part III of this report presents the results of the semi-annual survey on manufacture and scheduling of heavy electric power equipment made as of January 1, 1985, by the Electric Power Survey Committee of the Edison Electric Institute in cooperation with representatives of the electric utility industry throughout the contiguous United States, with the nation's principal manufacturers of heavy electric power equipment, and with those foreign manufacturers supplying electric generating equipment to U.S electric power systems.

The Electric Power Survey Committee is the only group servicing the electric utility and allied industries that conducts surveys on the manufacture and scheduling of heavy electric power equipment on a semi-annual basis. These surveys are also unique in that information on each planned project is cross checked with both the manufacturer and the system ordering the equipment. Furthermore, the time frame for ordered and scheduled units is not limited to ten years, but extends into the future as far out as equipment is officially ordered and scheduled for installation. The resulting data file also allows the semi-annual tracking of unit slippages and cancellations.

Projections presented in this report are based on the best information available from the turn of the year through the end of the first quarter of 1985. There could, however, be delays in the installation of scheduled capacity and reductions in the percent capacity margins. This may occur, for example, due to the inability of utilities to secure the financing or the regulatory approvals necessary to sustain the construction of new generating capacity. It is essential that the installation of both nuclear and coal-fired generating units proceed as currently scheduled and that conservation and load management programs be pursued at the same time to assure an adequate bulk electric power supply into the 1990s.

Definitions of the terms used in this report, together with information concerning methods of summarizing the data, appear on the following page.

# DEFINITIONS AND METHODS OF SUMMARIZATION

**INSTALLED CAPABILITY** is the maximum load which a generating unit or a group of units can carry under specified conditions for a given period of time. Installed capability values are shown in the historical summer and winter tables.

**CAPABILITY,** as projected in this report, is equivalent to Planned Resources, defined by the North American Electric Reliability Council to include the total installed generating capacity which is existing, presently under construction, or in various stages of planning; plus scheduled capacity purchases, less scheduled capacity sales; less total generating capacity out of service in deactivated shutdown status. This capability must provide for the projected load plus scheduled maintenance, forced outages, system operating requirements, and any unforeseen load. The capabilities of all systems normally interconnected are based upon fully coordinated operation. Peak capability refers to the maximum capability, as defined above, the approximate time and for the duration of the load referred to, that is, at the time of the summer peak load or the winter peak load. Regional capability, as reported herein, is the sum of the capabilities of the systems serving the region.

**PEAK LOAD** for a region may be either coincident or non-coincident. It is the sum of the actual or projected peak load of the electric utilities and any self-generating industrial facilities.

**HISTORICAL AND PROJECTED INSTALLED MARGIN** shown on the summer and winter tables represents the difference between Installed Capability and Peak Load. It is the margin available to replace generating equipment out of service due to planned scheduled maintenance, forced outages, and equipment deratings due to various causes. In addition, Installed Margin must provide an Operating Reserve to cover variations in peak load, and to regulate frequency and control transmission tie-line schedules.

**CAVEATS** Because some maximum regional loads may occur in winter rather than in summer, the installed margin for the country as a whole is not necessarily valid with respect to the electric power situation at that time.

It is also true that regional installed capacity margins [and hence the installed margin for the sum of the regions] in summer or winter have not always represented the minimum or the maximum margin. The extremes of installed capacity margins may be influenced, for example, by the date of bringing new large generating facilities into commercial operation in relation to the time of the annual peak loads – the addition of a very large generating unit just before the peak could give a larger margin during the peak period than that which existed before the time of peak. Also, in areas having high proportions of hydroelectric generating capacity, the lowest margins may occur at times other than when the load is at a maximum because of low capability resulting from minimum water for power generation.

The adequacy of projected power supply cannot be judged solely by the use of installed capacity margins without proper recognition of the potential impact of planned and forced outages of generating equipment. There have been several occasions within the past 15 years when the entire installed margin has been utilized to offset such outages of generating equipment, resulting in system-wide voltage reductions, interruption of interruptible loads, public appeals, and some interruption of firm customer load.

**PERCENT CAPACITY MARGIN** is the installed margin divided by capability multiplied by 100.

**LOAD FACTOR** is the ratio of the megawatthour output supplied during a designated period to the output that would have occurred had the peak experienced during that period been constant throughout the period. For example, Annual Percent Load Factor is calculated by multiplying annual megawatthour requirements by 100 and dividing by the product of the annual peak load and the number of hours in a year (8,760 in normal years, 8,784 in leap years).

**TOTAL U.S.,** as used in this publication, is equivalent to the lower forty-eight contiguous states; Alaska and Hawaii are omitted.

**AVERAGE ANNUAL COMPOUND GROWTH RATES** are calculated on a point-to-point basis, either by taking the fourth root of the difference between the values for the first and fifth historical years in Tables 1, 2, and 4, or the ninth root of the difference between the first and tenth projected years in Tables 10, 11, and 13.

# CAPABILITIES, PEAK LOADS, AND PERCENT CAPACITY MARGINS

## INDUSTRY PERFORMANCE IN 1984

During the year 1984, the electric power systems of the contiguous United States placed 19.3 thousand megawatts of additional electric generating capacity into commercial operation. This includes all units of 4 megawatts capacity and larger. Of this total, 13 units with capability ratings aggregating 1,689 megawatts are hydraulic, and 26 units totaling 17.6 thousand megawatts are thermal. Seven of the thermal units were powered by nuclear fuel, and nineteen were conventional steam turbine-generators. The individual generating units that make up the 19.7 thousand megawatts added during 1984 are identified in the actual additions listing on page 15.

This newly added capacity contributed to the increase in the total capability, or load-carrying ability, of the U.S. electric power systems to 616.6 thousand megawatts at the year end—an increase of 0.8 percent over the total at the end of 1983.

Of the total capability of 616.6 thousand megawatts, approximately 87 percent is thermal and the rest hydraulic. During the past five years, the total capability of the country's electric power systems has increased at an average annual rate of 1.9 percent.

The combined 1984 summer peak load, shown in Table 1 of this report, was 451.2 thousand megawatts or 3.4 percent higher than the 1984/85 winter peak load. This is the twenty-first consecutive year during which the combined summer peak load exceeded the peak of the following winter. The point-to-point compound average annual increase between the 1980 and 1984 summer peak loads was 1.4 percent.

Table 2 shows that the combined winter 1984/85 peak load of the contiguous United States was 436.3 thousand megawatts—6.2 percent higher than the winter 1983/84 peak load. The change in peak load during the past five years, from winter 1980/81, was a net increase of 51.7 thousand megawatts, and is equivalent to an average annual increase of 3.2 percent on a point-to-point compounded basis.

As can be seen from Table 4, during 1984 the energy requirements for the contiguous United States amounted to 2.4 billion megawatthours—4.4 percent higher than the output for 1983. The point-to-point compound average annual increase between 1980 and 1984 for energy requirements was 1.6 percent.

The 1984 annual load factor for the sum of the nine regions was 59.7 percent.

# Table 1/SUMMER INSTALLED CAPABILITIES, PEAK LOADS, INSTALLED MARGINS & PERCENT CAPACITY MARGINS (Megawatts)

| Regions | | 1980 | 1981 | 1982 | 1983 | 1984 | 84/83 % Inc | Growth Rate 1980-1984* |
|---|---|---|---|---|---|---|---|---|
| NPCC | Installed Capability | 51,069 | 50,504 | 50,563 | 50,508 | 51,312 | 1.6% | 0.1% |
| | Peak Load | 36,831 | 35,640 | 36,427 | 37,627 | 38,144 | 1.4% | 0.9% |
| | Installed Margin | 14,238 | 14,864 | 14,136 | 12,881 | 13,168 | | |
| | % Capacity Margin | 27.9% | 29.4% | 28.0% | 25.5% | 25.7% | | |
| MAAC | Installed Capability | 45,008 | 45,109 | 46,461 | 46,734 | 46,183 | -1.2% | 0.6% |
| | Peak Load | 34,525 | 33,633 | 33,846 | 34,783 | 35,442 | 1.9% | 0.7% |
| | Installed Margin | 10,483 | 11,476 | 12,615 | 11,951 | 10,741 | | |
| | % Capacity Margin | 23.3% | 25.4% | 27.2% | 25.6% | 23.3% | | |
| ECAR | Installed Capability | 88,222 | 89,495 | 89,919 | 90,914 | 90,115 | -0.9% | 0.5% |
| | Peak Load | 63,021 | 64,150 | 59,668 | 65,959 | 65,851 | -0.2% | 1.1% |
| | Installed Margin | 25,201 | 25,345 | 30,251 | 24,955 | 24,264 | | |
| | % Capacity Margin | 28.6% | 28.3% | 33.6% | 27.4% | 26.9% | | |
| SERC | Installed Capability | 111,315 | 117,293 | 121,533 | 124,999 | 127,562 | 2.1% | 3.5% |
| | Peak Load | 89,815 | 90,513 | 86,229 | 97,235 | 93,400 | -3.9% | 1.0% |
| | Installed Margin | 21,500 | 26,780 | 35,304 | 27,764 | 34,162 | | |
| | % Capacity Margin | 19.3% | 22.8% | 29.0% | 22.2% | 26.8% | | |
| MAIN | Installed Capability | 41,706 | 40,795 | 40,578 | 40,797 | 41,608 | 2.0% | -0.1% |
| | Peak Load | 33,894 | 32,561 | 31,394 | 34,704 | 35,186 | 1.4% | 0.9% |
| | Installed Margin | 7,812 | 8,234 | 9,184 | 6,093 | 6,422 | | |
| | % Capacity Margin | 18.7% | 20.2% | 22.6% | 14.9% | 15.4% | | |
| SPP | Installed Capability | 50,576 | 54,215 | 58,236 | 59,294 | 60,389 | 1.8% | 4.5% |
| | Peak Load | 44,981 | 44,623 | 43,064 | 45,881 | 45,562 | -0.7% | 0.3% |
| | Installed Margin | 5,595 | 9,592 | 15,172 | 13,413 | 14,827 | | |
| | % Capacity Margin | 11.1% | 17.7% | 26.1% | 22.6% | 24.6% | | |
| ERCOT | Installed Capability | 42,486 | 43,045 | 43,452 | 43,800 | 44,056 | 0.6% | 0.9% |
| | Peak Load | 31,722 | 32,535 | 33,231 | 34,972 | 36,851 | 5.4% | 3.8% |
| | Installed Margin | 10,764 | 10,510 | 10,221 | 8,828 | 7,205 | | |
| | % Capacity Margin | 25.3% | 24.4% | 23.5% | 20.2% | 16.4% | | |
| MAPP | Installed Capability | 25,598 | 27,371 | 27,331 | 27,952 | 28,161 | 0.7% | 2.4% |
| | Peak Load | 19,378 | 18,985 | 19,470 | 20,785 | 20,666 | -0.6% | 1.6% |
| | Installed Margin | 6,220 | 8,386 | 7,861 | 7,167 | 7,495 | | |
| | % Capacity Margin | 24.3% | 30.6% | 28.8% | 25.6% | 26.6% | | |
| WSCC | Installed Capability | 102,257 | 104,392 | 108,069 | 111,451 | 114,854 | 3.1% | 2.9% |
| | Peak Load | 72,891 | 75,655 | 71,580 | 75,580 | 80,048 | 5.9% | 2.4% |
| | Installed Margin | 29,366 | 28,737 | 36,489 | 35,871 | 34,806 | | |
| | % Capacity Margin | 28.7% | 27.5% | 33.8% | 32.2% | 30.3% | | |
| TOTAL UNITED STATES** | Installed Capability | 558,237 | 572,219 | 586,142 | 596,449 | 604,240 | 1.3% | 2.0% |
| | Peak Load | 427,058 | 428,295 | 414,909 | 447,526 | 451,150 | 0.8% | 1.4% |
| | Installed Margin | 131,179 | 143,924 | 171,233 | 148,923 | 153,090 | | |
| | % Capacity Margin | 23.5% | 25.2% | 29.2% | 25.0% | 25.3% | | |

*Compound annual growth rate from 1980 to 1984.

**U.S. totals are meaningless and should not be used for policy purposes.

NOTE: For definitions of terms see page 5

# Table 2/WINTER INSTALLED CAPABILITIES, PEAK LOADS, INSTALLED MARGINS & PERCENT CAPACITY MARGINS (Megawatts)

| Regions | | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 | 84/83 % Inc | Growth Rate 1980-1984* |
|---|---|---|---|---|---|---|---|---|
| NPCC | Installed Capability | 52,986 | 53,060 | 52,289 | 52,018 | 53,076 | 2.0% | 0% |
| | Peak Load | 35,340 | 35,199 | 34,755 | 35,836 | 37,321 | 4.1% | 1.4% |
| | Installed Margin | 17,646 | 17,861 | 17,534 | 16,182 | 15,755 | | |
| | % Capacity Margin | 33.3% | 33.7% | 33.5% | 31.1% | 29.7% | | |
| MAAC | Installed Capability | 47,638 | 46,567 | 48,330 | 49,283 | 49,646 | 0.7% | 1.0% |
| | Peak Load | 29,730 | 30,726 | 28,197 | 30,150 | 33,384 | 10.7% | 2.9% |
| | Installed Margin | 17,908 | 15,841 | 20,133 | 19,133 | 16,262 | | |
| | % Capacity Margin | 37.6% | 34.0% | 41.7% | 38.8% | 32.8% | | |
| ECAR | Installed Capability | 89,836 | 91,731 | 91,045 | 91,642 | 94,304 | 2.9% | 1.2% |
| | Peak Load | 62,225 | 63,188 | 56,559 | 63,820 | 67,349 | 5.5% | 2.0% |
| | Installed Margin | 27,611 | 28,543 | 34,486 | 27,822 | 26,955 | | |
| | % Capacity Margin | 30.7% | 31.1% | 37.9% | 30.4% | 28.6% | | |
| SERC | Installed Capability | 116,472 | 122,379 | 125,575 | 129,941 | 129,105 | -0.6% | 2.6% |
| | Peak Load | 90,354 | 93,348 | 85,664 | 91,459 | 106,837 | 16.8% | 4.3% |
| | Installed Margin | 26,118 | 29,031 | 39,911 | 38,482 | 22,268 | | |
| | % Capacity Margin | 22.4% | 23.7% | 31.8% | 29.6% | 17.2% | | |
| MAIN | Installed Capability | 42,212 | 41,596 | 42,082 | 44,132 | 44,589 | 1.0% | 1.4% |
| | Peak Load | 26,631 | 26,965 | 24,303 | 28,159 | 27,805 | -1.3% | 1.1% |
| | Installed Margin | 15,581 | 14,631 | 17,779 | 15,973 | 16,784 | | |
| | % Capacity Margin | 36.9% | 35.2% | 42.2% | 36.2% | 37.6% | | |
| SPP | Installed Capability | 51,186 | 54,004 | 56,960 | 59,571 | 60,971 | 2.4% | 4.5% |
| | Peak Load | 30,681 | 32,087 | 32,743 | 35,799 | 35,112 | -1.9% | 3.4% |
| | Installed Margin | 20,505 | 21,917 | 24,217 | 23,772 | 25,859 | | |
| | % Capacity Margin | 40.1% | 40.6% | 42.5% | 39.9% | 42.4% | | |
| ERCOT | Installed Capability | 42,248 | 40,627 | 43,451 | 43,943 | 44,163 | 0.5% | 1.1% |
| | Peak Load | 23,962 | 25,393 | 25,347 | 29,684 | 31,937 | 7.6% | 7.4% |
| | Installed Margin | 18,286 | 15,234 | 18,104 | 14,259 | 12,226 | | |
| | % Capacity Margin | 43.3% | 37.5% | 41.7% | 32.4% | 27.7% | | |
| MAPP | Installed Capability | 26,541 | 28,651 | 28,652 | 29,088 | 28,927 | -0.6% | 2.2% |
| | Peak Load | 17,420 | 17,508 | 17,816 | 18,807 | 18,989 | 1.0% | 2.2% |
| | Installed Margin | 9,121 | 11,143 | 10,836 | 10,281 | 9,938 | | |
| | % Capacity Margin | 34.4% | 38.9% | 37.8% | 35.3% | 34.4% | | |
| WSCC | Installed Capability | 103,076 | 102,469 | 108,546 | 112,019 | 111,792 | -0.2% | 2.1% |
| | Peak Load | 68,224 | 66,692 | 67,934 | 77,065 | 77,579 | 0.7% | 3.3% |
| | Installed Margin | 34,852 | 35,777 | 40,612 | 34,954 | 34,213 | | |
| | % Capacity Margin | 33.8% | 34.9% | 37.4% | 31.2% | 30.6% | | |
| TOTAL UNITED STATES** | Installed Capability | 572,195 | 581,084 | 596,930 | 611,637 | 616,573 | 0.8% | 1.9% |
| | Peak Load | 384,567 | 391,106 | 373,318 | 410,779 | 436,313 | 6.2% | 3.2% |
| | Installed Margin | 187,628 | 189,978 | 223,612 | 200,858 | 180,260 | | |
| | % Capacity Margin | 32.8% | 32.7% | 37.5% | 32.8% | 29.2% | | |

*Compound annual growth rate from 1980/81 to 1984/85.

**U.S. totals are meaningless and should not be used for policy purposes.

NOTE: For definitions of terms see page 5

## RELATIONSHIP BETWEEN SUMMER AND WINTER PEAK LOADS/1980-1984

The relationship between the summer and winter peak loads in the different regions of the country, and also for the contiguous United States, are shown in the accompanying table, where the summer peak load in each case is expressed as a percentage of the winter peak load for the following season.

In those regions where the summer peak load has been characteristically higher than the peak during the following winter, the percentage figure has, expectedly, been above 100 percent. This had been true particularly in SPP and ERCOT, where, due to climatic conditions, heavy air conditioning loads during the summer months have caused peaks that far exceed those during the following winter.

Since the mid-1960s, summer peaks for the country as a whole have generally exceeded the peaks for the following winter by increasing amounts. In 1970, and again in 1971, apparently normal summer peaks were followed by winter peaks depressed both by mild weather and reduced industrial loads. This combination produced summer to winter peak relationships of 111 percent and 112 percent respectively in 1970 and 1971.

After falling back to 110 percent in 1972, the summer/winter ratio jumped to an all-time high of 117 percent in 1973 because of the unprecedented drop in the winter peak load from the year previous. The ratio lowered only one point in 1974 since both the summer and winter peak loads were little changed from those experienced in 1973. Through the rest of the 1970s the ratio fluctuated in the more normal range of between 106 and 108 percent. The hot summer of 1980 and the economic downturn of 1981 helped to produce values of 111 and 110 percent respectively. In 1982 the summer peak dropped 3.1 percent and winter peak dropped 4.5 percent. The greater relative decline in the winter peak caused the summer/winter ratio to increase to 111 in 1982. The national ratio dropped to 109 percent in 1983. Then, due to a rebound in the 1984/85 winter peak load, the ratio fell to 103 percent in 1984, the lowest value registered since 1965.

## Table 3/SUMMER PEAK LOADS EXPRESSED AS PERCENTAGE OF PEAK LOAD FOR THE FOLLOWING WINTER

| Regions | 1968 | 1969 | 1970 | 1971 | 1972 | 73/74 | 74/75 | 75/76 | 76/77 | 77/78 | 78/79 | 79/80 | 80/81 | 81/82 | 82/83 | 83/84 | 84/85 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | 96 | 99 | 96 | 101 | 98 | 111 | 104 | 102 | 96 | 105 | 102 | 100 | 104 | 101 | 105 | 105 | 102 |
| MAAC | 114 | 114 | 114 | 118 | 118 | 133 | 123 | 114 | 108 | 115 | 111 | 114 | 116 | 109 | 120 | 115 | 106 |
| ECAR | 101 | 100 | 102 | 107 | 103 | 112 | 105 | 102 | 97 | 101 | 99 | 104 | 101 | 102 | 105 | 103 | 98 |
| SERC | 102 | 105 | 111 | 109 | 108 | 106 | 109 | 100 | 93 | 99 | 99 | 101 | 99 | 97 | 101 | 106 | 87 |
| MAIN | 121 | 120 | 120 | 125 | 121 | 133 | 125 | 119 | 122 | 122 | 118 | 123 | 127 | 121 | 129 | 123 | 127 |
| SPP | 139 | 147 | 155 | 146 | 149 | 143 | 156 | 124 | 144 | 144 | 138 | 133 | 147 | 139 | 132 | 128 | 130 |
| ERCOT | 150 | 160 | 153 | 149 | 146 | 149 | 157 | 141 | 142 | 142 | 134 | 130 | 132 | 128 | 131 | 118 | 115 |
| MAPP | 108 | 109 | 110 | 112 | 110 | 125 | 119 | 106 | 103 | 103 | 111 | 105 | 111 | 108 | 109 | 111 | 109 |
| WSCC | 87 | 97 | 97 | 97 | 96 | 104 | 107 | 104 | 107 | 107 | 98 | 100 | 107 | 113 | 105 | 98 | 103 |
| U.S. TOTAL | 105 | 109 | 111 | 112 | 110 | 117 | 116 | 108 | 106 | 106 | 107 | 108 | 111 | 110 | 111 | 109 | 103 |

# ANNUAL ENERGY REQUIREMENTS AND ANNUAL LOAD FACTORS/1980-84

The 1984 energy requirements and annual load factors by reliability council are given in Tables 4 and 5, together with corresponding information for the previous four years.

Table 4 shows that during 1984 electric energy requirements for the contiguous United States amounted to 2.4 billion megawatthours—4.4 percent higher than the output for 1983. The point-to-point compound average annual increase between 1980 and 1984 for energy requirements was 1.6 percent.

As can be seen from Table 5, the 1984 annual load factor for the sum of the nine regions only increased to 59.7 percent. The usual value runs in the low 60 percent range. In 1984, for the second year in a row, the summer peak increased more than twice as much as energy output.

## Table 4/ANNUAL ENERGY REQUIREMENTS (Megawatthours in Thousands)

| Regions | 1980 | 1981 | 1982 | 1983 | 1984 | 84/83 % Inc | Growth Rate 1980-1984* |
|---|---|---|---|---|---|---|---|
| NPCC | 203,954 | 202,620 | 201,377 | 210,815 | 217,455 | 3.1% | 1.6% |
| MAAC | 175,622 | 174,688 | 171,662 | 179,990 | 186,034 | 3.4% | 1.5% |
| ECAR | 366,198 | 366,376 | 347,091 | 364,501 | 383,029 | 5.1% | 1.1% |
| SERC | 479,715 | 483,595 | 466,832 | 490,899 | 502,915 | 2.4% | 1.2% |
| MAIN | 166,116 | 162,899 | 158,116 | 165,974 | 170,930 | 3.0% | 0.7% |
| SPP | 213,381 | 211,833 | 211,595 | 217,688 | 225,642 | 3.7% | 1.4% |
| ERCOT | 162,327 | 164,920 | 169,769 | 173,372 | 185,283 | 6.9% | 3.4% |
| MAPP | 96,422 | 96,307 | 96,992 | 102,526 | 105,378 | 2.8% | 2.2% |
| WSCC | 428,983 | 447,788 | 435,310 | 435,868 | 468,937 | 7.6% | 2.3% |
| TOTAL U.S. | 2,292,718 | 2,311,026 | 2,258,744 | 2,341,633 | 2,445,603 | 4.4% | 1.6% |

*Compound annual growth rate from 1980 to 1984

## Table 5/ANNUAL LOAD FACTOR, %

| Regions | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|
| NPCC | 63.0 | 64.9 | 63.1 | 64.0 | 64.9 |
| MAAC | 57.9 | 59.3 | 57.9 | 59.1 | 59.8 |
| ECAR | 66.2 | 65.2 | 66.4 | 63.1 | 64.7 |
| SERC | 60.4 | 59.1 | 61.8 | 57.6 | 53.6 |
| MAIN | 55.8 | 57.1 | 57.5 | 54.6 | 55.3 |
| SPP | 54.0 | 54.2 | 56.1 | 54.2 | 56.4 |
| ERCOT | 58.3 | 57.9 | 58.3 | 56.6 | 57.2 |
| MAPP | 56.6 | 57.9 | 56.9 | 56.3 | 58.0 |
| WSCC | 67.0 | 67.6 | 69.4 | 64.6 | 66.7 |
| TOTAL U.S. | 61.0 | 61.2 | 62.1 | 59.5 | 59.7 |

# Table 6A/CHANGES IN SCHEDULED OPERATION DATE OF NUCLEAR AND FOSSIL-FIRED STEAM TURBINE-GENERATORS, 300MW OR LARGER, REMOVED FROM SCHEDULE BETWEEN JANUARY 1, 1984 AND JANUARY 1, 1985

| Owner | Unit Name & Number | | Net Expected Capability MW | Scheduled Operation Date as of Jan. 1, 1983 | Scheduled Operation Date as of Jan. 1, 1984 |
|---|---|---|---|---|---|
| Nuclear Removals: | | | | | |
| Cleveland Electric Illuminating Co. | Perry No. 2 | | 1,205 | 1-88 | Removed |
| Consumers Power Company | Midland No. 2 | | 805 | 7-86 | Removed |
| Public Service Company of Indiana | Marble Hill No. 1 | | 1,130 | 9-86 | Removed |
| Public Service Company of Indiana | Marble Hill No. 2 | | 1,130 | 3-88 | Removed |
| Public Service Company of New Hampshire | Seabrook No. 2 | | 1,150 | 1-91 | Removed |
| | Total Nuclear Units Removed from Schedule: | 5 | 5,420 | | |
| Fossil Removals: | | | | | |
| Kentucky Utilities Company | Hancock No. 2 | | 650 | 4-94 | Removed |
| Otter Tail Power Company | Spiritwood No. 2 | | 108 | 9-92 | Removed |
| Utah Power & Light Company | Hunter No. 4 | | 400 | 6-91 | Removed |
| | Total Fossil Units Removed from Schedule: | 3 | 1,158 | | |

# Table 6B/CHANGES IN SCHEDULED OPERATION DATE OF NUCLEAR AND FOSSIL-FIRED STEAM TURBINE-GENERATORS, 300 MW OR LARGER, DELAYED A YEAR OR MORE BETWEEN JANUARY 1, 1984 AND JANUARY 1, 1985

| Owner | Unit Name & Number | | Net Expected Capability mW | Scheduled Operation Date as of Jan. 1, 1983 | Scheduled Operation Date as of Jan. 1, 1984 |
|---|---|---|---|---|---|
| Nuclear Delays: | | | | | |
| Duquesne Light Company | Beaver Valley No. 2 | | 833 | 5-86 | 12-87 |
| Mississippi Power & Light Company | Grand Gulf No. 2 | | 1,250 | 4-90 | 4-91 |
| Texas Utilities Company System | Comanche Peak No. 1 | | 1,150 | 1-85 | 1-86 |
| Texas Utilities Company System | Comanche Peak No. 2 | | 1,150 | 7-86 | 7-87 |
| Washington Public Power Supply System | WPPSS No. 1 | | 1,250 | 6-91 | 9-93 |
| Washington Public Power Supply System | WPPSS No. 3 | | 1,240 | 12-89 | 3-92 |
| | Total Nuclear Units Delayed: | 6 | 6,873 | | |
| Fossil Delays: | | | | | |
| American Electric Power Company | Rockport No. 2 | | 1,300 | 9-86 | 12-88 |
| Arizona Public Service Company | Cholla No. 5 | | 340 | 6-93 | 6-95 |
| Baltimore Gas & Electric Company | Brandon Shores No. 2 | | 640 | 12-88 | 5-92 |
| Brazos Electric Power Coop | San Miguel No. 2 | | 400 | 1-91 | 7-92 |
| Central Power & Light Company | Coleto Creek No. 2 | | 640 | 12-90 | 12-93 |
| Iowa Electric Light & Power Company | Guthrie County No. 1 | | 650 | 12-90 | 12-95 |
| Louisville Gas & Electric Company | Trimble County No. 1 | | 495 | 6-87 | 7-88 |
| Public Service Company of Colorado | Pawnee No. 2 | | 485 | 4-90 | 4-91 |
| South Carolina Public Service Authority | Cross No. 1 | | 500 | 5-91 | 5-93 |
| Texas Utilities Company System | Forest Grove No. 1 | | 750 | 1-89 | 2-93 |
| Texas Utilities Company System | Martin Lake No. 4 | | 750 | 1-91 | 1-94 |
| Texas Utilities Company System | Twin Oak No. 1 | | 750 | 2-89 | 1-91 |
| Texas Utilities Company System | Twin Oak No. 2 | | 750 | 2-90 | 1-92 |
| Tucson Electric Power Company | Springerville No. 2 | | 330 | 6-87 | 6-89 |
| | Total Fossil Units Delayed: | 14 | 8,780 | | |

# ADDITIONS TO ELECTRIC GENERATING CAPABILITY/1984

The 1984 additions to electric generating capability in the contiguous United States are shown in the top part of Table VII according to the type of generating units. The second portion of the table presents the same information arranged according to the reliability councils in which the new capability was installed. The third portion of the table reports the same information classified according to ownership of the new units.

## Table 7/1984 ADDITIONS TO ELECTRIC GENERATING CAPABILITY (In Terms of Net Expected Capabilities of the Units)

| | THERMAL | | | | | | | | HYDRAULIC | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Steam Turbine-Generators | | | | Combustion Turbine-Generators | | Diesel Engine-Generators | | | | | | Total | |
| | Nuclear | | Conventional | | | | | | Conventional | | Pumped-Storage | | | |
| | No. of Units | MW | No. of Units | MW | No. of Units | MW | No. of Units | MW | No. of Units | MW | No. of Units | MW | No. of Units | MW |
| 1984 ADDITIONS | 7 | 7,556 | 19 | 10,082 | - | - | - | - | 9 | 475 | 4 | 1,214 | 39 | 19,327 |
| ADDITIONS BY REGION | | | | | | | | | | | | | | |
| NPCC | - | - | 2 | 675 | - | - | - | - | - | - | - | - | 2 | 675 |
| MAAC | - | - | 1 | 637 | - | - | - | - | - | - | - | - | 1 | 637 |
| ECAR | - | - | 4 | 2,871 | - | - | - | - | - | - | - | - | 4 | 2,871 |
| SERC | 2 | 2,080 | 4 | 2,528 | - | - | - | - | 3 | 60 | - | - | 9 | 4,668 |
| MAIN | 3 | 3,276 | - | - | - | - | - | - | - | - | - | - | 3 | 3,276 |
| SPP | - | - | 2 | 1,331 | - | - | - | - | 1 | 28 | 1 | 32 | 4 | 1,391 |
| ERCOT | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MAPP | - | - | 1 | 460 | - | - | - | - | - | - | - | - | 1 | 460 |
| WSCC | 2 | 2,200 | 5 | 1,580 | - | - | - | - | 5 | 387 | 3 | 1,182 | 15 | 5,349 |
| ADDITIONS BY OWNERSHIP | | | | | | | | | | | | | | |
| Investor-Owned | 6 | 6,456 | 11 | 7,267 | - | - | - | - | - | - | 3 | 1,182 | 20 | 14,905 |
| Federal | - | - | - | - | - | - | - | - | 7 | 363 | 1 | 32 | 8 | 395 |
| Municipal | - | - | 1 | 50 | - | - | - | - | - | - | - | - | 1 | 50 |
| Cooperative | - | - | 5 | 2,065 | - | - | - | - | - | - | - | - | 5 | 2,065 |
| State and Local | 1 | 1,100 | 2 | 700 | - | - | - | - | 2 | 112 | - | - | 5 | 1,912 |

# Table 8/1984 ADDITIONS TO ELECTRIC GENERATING CAPABILITY
## U.S. Electric Power Systems
## Units 4,000 Kw and Larger

SYMBOLS:

Investor-Owned . . . . . I
Federal . . . . . F
Municipal . . . . . M
Cooperative . . . . . C
State & Local . . . . . SL
Thermal
- Conventional steam turbine-generator . . . . . T
- Nuclear steam turbine-generator . N
- Combustion turbine-generator . . G
- Diesel engine-generator . . . . . D

Hydraulic
- Hydraulic turbine-generator . . . . . H

Pumped-Storage
- Pumped-storage turbine-generator . . . . . S
- Reversible pumped-storage turbine-generator . . . . . R

Combined-Cycle
- Combustion turbine-generator for combined-cycle operation . . . . . GC
- Conventional steam turbine-generator for combined-cycle operation . . . . . TC

+ Denotes multiple ownership of the unit. In such cases, the name of the participating power system in whose service area the installation will be located is shown. In case the location does not fall within the service area of any of the participants, the name of the power system shown is the first in alphabetical order among the major participants.

NOTES: Megawatts shown for individual generating units represent, in most cases, the net operating capability expected by the power systems; in other cases they represent the manufacturer's nameplate rating of the unit.

| REGION | S Y S T E M | U N I T | OWNER-SHIP | TYPE | FOSSIL FUELS | MW of NET EXPECTED CAPABILITY |
|---|---|---|---|---|---|---|
| NPCC | BURLINGTON VERMONT | McNEIL NO 1 | M | T | Wood | 50 |
| NPCC | NEW YORK STATE ELEC & GAS COMPANY | SOMERSET NO 1 | I | T | Coal | 625 |
| MAAC | BALTIMORE GAS & ELECTRIC CO | BRANDON SHORES NO 1 | I | T | Oil/Coal | 637 |
| ECAR | AMERICAN ELECTRIC POWER CO | ROCKPORT NO 1 | I | T | Coal | 1,300 |
| ECAR | BIG RIVERS ELECTRIC CORP | D B WILSON NO 1 | C | T | Coal | 395 |
| ECAR | +DETROIT EDISON COMPANY | BELLE RIVER NO 1 | I | T | Coal | 676 |
| ECAR | KENTUCKY UTILITIES | GHENT NO 4 | I | T | Coal | 500 |
| SERC | DUKE POWER COMPANY | McGUIRE NO 2 | I | N | | 1,180 |
| SERC | FLORIDA POWER CORPORATION | CRYSTAL RIVER NO 5 | I | T | Coal | 670 |
| SERC | +GEORGIA POWER COMPANY | SCHERER NO 2 | I | T | Coal | 808 |
| SERC | SEMINOLE ELECTRIC COOP | SEMINOLE NO 2 | C | T | Coal | 600 |
| SERC | +SO CAROLINA ELECTRIC & GAS CO | SUMMER NO 1 | I | N | | 900 |
| SERC | SO CAROLINA PUBLIC SERVICE AUTHY | CROSS NO 2 | SL | T | Coal | 450 |
| SERC | U S ARMY CORPS OF ENGINEERS | ST STEPHEN NO 1 | F | H | | 20 |
| SERC | U S ARMY CORPS OF ENGINEERS | ST STEPHEN NO 2 | F | H | | 20 |
| SERC | U S ARMY CORPS OF ENGINEERS | ST STEPHEN NO 3 | F | H | | 20 |
| MAIN | COMMONWEALTH EDISON CO | LASALLE COUNTY NO 1 | I | N | | 1,078 |
| MAIN | COMMONWEALTH EDISON CO | LASALLE COUNTY NO 2 | I | N | | 1,078 |
| MAIN | UNION ELECTRIC COMPANY | CALLAWAY NO 1 | I | N | | 1,120 |
| SPP | +ARKANSAS POWER & LIGHT CO | INDEPENDENCE NO 2 | I | T | Coal | 816 |
| SPP | OKLAHOMA GAS & ELECTRIC CO | MUSKOGEE NO 6 | I | T | Coal | 515 |

| REGION | S Y S T E M | U N I T | OWNER-SHIP | TYPE | FOSSIL FUELS | MW of NET EXPECTED CAPABILITY |
|---|---|---|---|---|---|---|
| SPP | U S ARMY CORPS OF ENGINEERS | CANNON NO 1 | F | R | | 32 |
| SPP | U S ARMY CORPS OF ENGINEERS | CANNON NO 2 | F | H | | 28 |
| MAPP | BASIN ELECTRIC POWER COOP | ANTELOPE VALLEY NO 1 | C | T | Coal | 460 |
| WSCC | COLORADO-UTE ELECTRIC ASSOCIATION | CRAIG NO 3 | C | T | Coal | 400 |
| WSCC | +MONTANA POWER COMPANY | COLSTRIP NO 3 | I | T | Coal | 700 |
| WSCC | PACIFIC GAS & ELECTRIC CO | HELMS NO 1 | I | R | | 394 |
| WSCC | PACIFIC GAS & ELECTRIC CO | HELMS NO 2 | I | R | | 394 |
| WSCC | PACIFIC GAS & ELECTRIC CO | HELMS NO 3 | I | R | | 394 |
| WSCC | PLAINS ELECTRIC G & T COOP | PEGS NO 1 | C | T | Coal | 210 |
| WSCC | PLATTE RIVER POWER AUTHORITY | RAWHIDE NO 1 | SL | T | Coal | 250 |
| WSCC | SNOHOMISH PUBLIC UTILITY DISTRICT | H M JACKSON NOS 1 & 2 | SL | H | | 95 |
| WSCC | SNOHOMISH PUBLIC UTILITY DISTRICT | H M JACKSON NOS 3 & 4 | SL | H | | 17 |
| WSCC | SOUTHERN CALIFORNIA EDISON CO | SAN ONOFRE NO 3 | I | N | | 1,100 |
| WSCC | U S ARMY CORPS OF ENGINEERS | LIBBY NO 5 | F | H | | 121 |
| WSCC | U S BUREAU OF RECLAMATION | GRAND COULEE PG-12 | F | H | | 54 |
| WSCC | U S BUREAU OF RECLAMATION | MT ELBERT NO 2 | F | H | | 100 |
| WSCC | UTAH POWER & LIGHT CO | BLUNDELL NO 1 | I | T | Geothermal | 20 |
| WSCC | +WASHINGTON PUB PWR SPLY SYSTEM | WNP NO 2 | SL | N | | 1,100 |

39 GENERATING UNITS WERE ADDED WITH TOTAL NET EXPECTED CAPABILITY OF 19,327 MW

## NUCLEAR ELECTRIC POWER GENERATING UNITS IN COMMERCIAL OPERATION

No steam turbine-generators for nuclear projects have been ordered since 1976, and no nuclear steam supply systems (reactors) since 1978.

As of January 1, 1985, nuclear capacity accounts for 52 percent of the aggregate of the industry's scheduled expansion program.

Table 9 shows subtotals of the amount of nuclear megawatts placed in service each year. As of January 1, 1985, there were 84 nuclear units in commercial operation with an aggregate winter rating of 67.1 thousand megawatts. There were seven additions to nuclear generating capacity during 1984.

# NUCLEAR ELECTRIC POWER GENERATING UNITS IN COMMERCIAL OPERATION

## Table 9/NUCLEAR POWER UNITS IN OPERATION IN THE CONTIGUOUS U.S. as of January 1, 1985

| SYSTEM | UNIT NAME & NO | YEAR PLACED IN COMMERCIAL OPERATION | CAPABILITY SUMMER MW | CAPABILITY WINTER MW | YEARLY SUBTOTALS OF SUMMER MW RATINGS |
|---|---|---|---|---|---|
| 1. Commonwealth Edison Company | Dresden No. 1 | 1960 | 197 | 207 | 197 |
| 2. Yankee Atomic Electric Company | Yankee No. 1 | 1961 | 175 | 176 | 175 |
| 3. Consumers Power Company | Big Rock Point | 1962 | 63 | 63 | 63 |
| 4. Washington Pub Pwr Sply Sys | Hanford | 1966 | 840 | 840 | 840 |
| 5. Conn Yankee Atomic Power Co. | Haddam No. 1 | 1968 | 555 | 580 | |
| 6. SoCal Edison & San Diego G &E | San Onofre No. 1 | 1968 | 436 | 436 | 991 |
| 7. GPU Nuclear Corporation | Oyster Creek No. 1 | 1969 | 620 | 650 | |
| 8. Niagara Mohawk Power Corp. | Nine Mile Point No. 1 | 1969 | 610 | 610 | |
| 9. Rochester Gas & Electric Corp. | Ginna No. 1 | 1969 | 470 | 470 | 1,700 |
| 10. Northeast Utilities | Millstone Point No. 1 | 1970 | 654 | 660 | |
| 11. Wisconsin Electric Power Co. | Point Beach No. 1 | 1970 | 495 | 495 | 1,149 |
| 12. Carolina Power & Light Co. | Robinson No. 2 | 1971 | 665 | 700 | |
| 13. Dairyland Power Cooperative | La Crosse | 1971 | 46 | 46 | |
| 14. Northern States Power Supply | Monticello No. 1 | 1971 | 536 | 557 | |
| 15. Commonwealth Edison Company | Dresden No. 2 | 1971 | 772 | 794 | 2,019 |
| 16. Boston Edison Company | Pilgrim No. 1 | 1972 | 670 | 670 | |
| 17. Commonwealth Edison Company | Quad Cities No. 1 | 1972 | 768 | 789 | |
| 18. Commonwealth Edison Company | Quad Cities No. 2 | 1972 | 769 | 789 | |
| 19. Florida Power & Light Company | Turkey Point No. 3 | 1972 | 666 | 696 | |
| 20. Maine Yankee Atomic Power Co. | Wiscasset | 1972 | 814 | 830 | |
| 21. Vermont Yankee N. Power Corp. | Vernon | 1972 | 496 | 528 | |
| 22. Virginia Electric & Power Co. | Surry No. 1 | 1972 | 775 | 775 | 4,958 |
| 23. Commonwealth Edison Company | Dresden No. 3 | 1973 | 773 | 794 | |
| 24. Consumers Power Company | Palisades No. 1 | 1973 | 635 | 740 | |
| 25. Duke Power Company | Oconee No. 1 | 1973 | 860 | 860 | |
| 26. Duke Power Company | Oconee No. 2 | 1973 | 860 | 860 | |
| 27. Florida Power & Light Company | Turkey Point No. 4 | 1973 | 666 | 696 | |
| 28. Northern States Power Company | Prairie Island No. 1 | 1973 | 503 | 523 | |
| 29. Omaha Public Power District | Fort Calhoun No. 1 | 1973 | 439 | 457 | |
| 30. Tennessee Valley Authority | Browns Ferry No. 1 | 1973 | 1,067 | 1,067 | |
| 31. Virginia Electric & Power Co. | Surry No. 2 | 1973 | 775 | 775 | |
| 32. Wisconsin Electric Power Co. | Point Beach No. 2 | 1973 | 495 | 495 | 7,073 |
| 33. Arkansas Power & Light Co. | Arkansas Nuclear No. 1 | 1974 | 836 | 836 | |
| 34. Commonwealth Edison Company | Zion No. 1 | 1974 | 1,040 | 1,040 | |
| 35. Commonwealth Edison Company | Zion No. 2 | 1974 | 1,040 | 1,040 | |
| 36. Consolidated Edison Co. of NY | Indian Point No. 2 | 1974 | 849 | 864 | |
| 37. Duke Power Company | Oconee No. 3 | 1974 | 860 | 860 | |

| SYSTEM | UNIT NAME & NO. | YEAR PLACED IN COMMERCIAL OPERATION | CAPABILITY SUMMER MW | CAPABILITY WINTER MW | YEARLY SUBTOTALS OF SUMMER MW RATINGS |
|---|---|---|---|---|---|
| 38. Iowa Electric Light & Power Co. | Arnold No. 1 | 1974 | 480 | 510 | |
| 39. GPU Nuclear Corporation | Three Mile Island No. 1 | 1974 | 776 | 800 | |
| 40. Nebraska Public Power District | Cooper Nuclear No. 1 | 1974 | 778 | 778 | |
| 41. Northern States Power Company | Prairie Island No. 2 | 1974 | 500 | 520 | |
| 42. Philadelphia Electric Company | Peach Bottom No. 2 | 1974 | 1,051 | 1,055 | |
| 43. Philadelphia Electric Company | Peach Bottom No. 3 | 1974 | 1,035 | 1,035 | |
| 44. Wisconsin Public Service Corp. | Kewaunee No. 1 | 1974 | 525 | 517 | 9,770 |
| 45. Baltimore Gas & Electric Co. | Calvert Cliffs No. 1 | 1975 | 810 | 820 | |
| 46. Carolina Power & Light Company | Brunswick No. 2 | 1975 | 790 | 790 | |
| 47. Georgia Power Company | Hatch No. 1 | 1975 | 771 | 771 | |
| 48. Indiana & Michigan Electric Co. | Cook No. 1 | 1975 | 1,050 | 1,050 | |
| 49. New York Power Authority | Fitzpatrick No. 1 | 1975 | 821 | 821 | |
| 50. Sacramento Utility District | Rancho Seco No. 1 | 1975 | 875 | 903 | |
| 51. Tennessee Valley Authority | Browns Ferry No. 2 | 1975 | 1,067 | 1,067 | 6,184 |
| 52. Duquesne Light Company | Beaver Valley No. 1 | 1976 | 800 | 800 | |
| 53. Florida Power & Light Company | St. Lucie No. 1 | 1976 | 777 | 795 | |
| 54. Northeast Utilities | Millstone Point No. 2 | 1976 | 864 | 864 | |
| 55. Portland General Electric Co. | Trojan | 1976 | 1,080 | 1,080 | |
| 56. New York Power Authority | Indian Point No. 3 | 1976 | 965 | 965 | 4,486 |
| 57. Alabama Power Company | Farley No. 1 | 1977 | 807 | 807 | |
| 58. Baltimore Gas & Electric Co. | Calvert Cliffs No. 2 | 1977 | 825 | 860 | |
| 59. Carolina Power & Light Company | Brunswick No. 1 | 1977 | 790 | 790 | |
| 60. Florida Power Corporation | Crystal River No. 3 | 1977 | 782 | 807 | |
| 61. Public Service Elec & Gas Co. | Salem Nuclear No. 1 | 1977 | 1,079 | 1,100 | |
| 62. Tennessee Valley Authority | Browns Ferry No. 3 | 1977 | 1,067 | 1,067 | |
| 63. Toledo Edison Company | Davis-Besse No. 1 | 1977 | 906 | 906 | 6,256 |
| 64. Indiana & Michigan Electric Co. | Cook No. 2 | 1978 | 1,100 | 1,100 | |
| 65. Virginia Electric & Power Co. | North Anna No. 1 | 1978 | 898 | 907 | 1,998 |
| 66. Georgia Power Company | Hatch No. 2 | 1979 | 771 | 771 | |
| 67. Public Service Co. of Colorado | Fort St. Vrain No. 1 | 1979 | 200 | 200 | 971 |
| 68. Arkansas Power & Light Co. | Arkansas Nuclear No. 2 | 1980 | 858 | 858 | |
| 69. Virginia Electric & Power Co. | North Anna No. 2 | 1980 | 870 | 870 | 1,728 |
| 70. Alabama Power Company | Farley No. 2 | 1981 | 812 | 812 | |
| 71. Duke Power Company | McGuire No. 1 | 1981 | 1,180 | 1,180 | |
| 72. Public Service Elec & Gas Co. | Salem Nuclear No. 2 | 1981 | 1,106 | 1,120 | |
| 73. Tennessee Valley Authority | Sequoyah No. 1 | 1981 | 1,128 | 1,128 | 4,226 |
| 74. Tennessee Valley Authority | Sequoyah No. 2 | 1982 | 1,148 | 1,148 | 1,148 |
| 75. Florida Power & Light Company | St. Lucie No. 2 | 1983 | 802 | 802 | |
| 76. Pennsylvania Power & Light Co. | Susquehanna No. 1 | 1983 | 1,050 | 1050 | |
| 77. SoCal Edison & San Diego G & E | San Onofre No. 2 | 1983 | 1,100 | 1,100 | 2,952 |
| 78. Commonwealth Edison Company | LaSalle County No. 1 | 1984 | 1,078 | 1,078 | |
| 79. Commonwealth Edison Company | LaSalle County No. 2 | 1984 | 1,078 | 1,078 | |
| 80. Duke Power Company | McGuire No. 2 | 1984 | 1,180 | 1,180 | |
| 81. South Carolina Electric & Gas | Summer No. 1 | 1984 | 900 | 900 | |
| 82. SoCal Edison & San Diego G & E | San Onofre No. 3 | 1984 | 1,100 | 1,100 | |
| 83. Union Electric Company | Callaway No. 1 | 1984 | 1,120 | 1,120 | |
| 84. Washington Pub Pwr Sply System | WNP No. 2 | 1984 | 1,100 | 1,100 | 7,556 |
| | 84 Nuclear units totaling: | | 66,440 SUMMER MW | 67,148 WINTER MW | |

# SUMMER CAPABILITIES, PEAK LOADS, AND PERCENT CAPACITY MARGINS

Summer peak capabilities, peak loads, and percent capacity margins as now forecast for the years 1985 through 1994 are shown in Table 1, page 21. Similar information for winter is shown in Table 2, page 23.

## SUMMER CAPABILITIES

The summer capability values shown in this report are generally below the projections for the same years 12 months ago. For the nine regions taken together, reductions range from 2.7 to 0.5 percent for the years 1985 through 1993.

The 1994 summer capability for the sum of the nine regions is projected at 716.8 thousand megawatts. This represents an average annual increase of 1.6 percent between the first and tenth forecast years.

The total capability of the electric utility industry of the contiguous United States, given herein for summer 1985 (619.1 thousand megawatts) and projected to summer 1994 (716.8 thousand megawatts), consists of the following types of equipment in approximately the proportions listed below.

| Summer Capability | 1985 | 1994 |
|---|---|---|
| Coal-Fired Steam Turbine-Generators | 43.4% | 43.8% |
| Oil-Fired Steam Turbine-Generators | 6.3 | 4.9 |
| Gas-Fired Steam Turbine-Generators | 6.6 | 5.2 |
| Dual-Fired Steam Turbine-Generators | 11.6 | 9.0 |
| Nuclear Steam Turbine-Generators | 10.3 | 15.7 |
| Conventional Hydro Generators | 11.5 | 9.6 |
| Pumped-Storage Generators | 2.4 | 2.8 |
| Combustion Turbine-Generators | 6.5 | 6.2 |
| Combined-Cycle Generators | 1.0 | 0.9 |
| Geothermal Turbine-Generators and other | 0.5 | 1.9 |
| | 100.0% | 100.0% |

## SUMMER PEAK LOADS

Preliminary figures published in the 1984 Post-Summer Electric Power Survey indicated that the 1984 summer peak load was 0.7 percent above 1983. According to final data now available, the actual increase in the 1984 summer peak load was 0.8 percent.

Summer peak load forecasts have been reduced by six of the nine reliability councils. NPCC, ECAR and WSCC increased their projections through 1993; MAAC increased them through 1988. For the nine regions taken together, peak loads are slightly higher through 1988 and slightly lower from 1989 through 1993, compared with values shown for those years in the 1983 Electric Power Annual Report.

The summer peak load for the sum of the nine regions, which was 451.2 thousand megawatts in 1984, is projected to be 465.1 thousand megawatts in 1985, an increase of 3.1 percent. For the summer of 1994, the projection is 566.8 thousand megawatts. This represents an average annual increase of 2.2 percent between the first and tenth forecast years.

## SUMMER PERCENT CAPACITY MARGINS

Of the 81 summer capacity margin percentages shown for the nine-year period 1985-1993 for the nine reliability councils, 47 of the values are lower than the equivalent respective values one year previous, 33 of the percent margins are higher, and one is unchanged. NPCC, MAAC, and ECAR show consistently lower percent margins from 1985 through 1993, and WSCC shows more decreases than increases for the same period. SERC, MAIN, SPP, ERCOT and MAPP show more increases than reductions in projected percent capacity margins.

Summer percent capacity margins for the country as a whole are lower from 1985 through 1992, generally because capability projections have been reduced more than expected peak loads. As now forecast, the summer capacity margins for the country range from 26.3 percent in 1987 to 20.9 percent in 1994, shown in these reports for the first time.

# Table 10/SUMMER CAPABILITIES, PEAK LOADS, INSTALLED MARGINS & PERCENT CAPACITY MARGINS/1985-1994 PROJECTED (Megawatts)

| Regions | | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | Growth Rate 1985-1994* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | Capability | 53,012 | 55,192 | 56,995 | 57,125 | 57,131 | 57,154 | 59,135 | 58,728 | 59,647 | 59,509 | 1.3% |
| | Peak Load | 39,630 | 40,320 | 40,680 | 41,330 | 41,920 | 42,530 | 43,324 | 44,128 | 44,686 | 45,517 | 1.6% |
| | Installed Margin | 13,382 | 14,872 | 16,315 | 15,795 | 15,211 | 14,624 | 15,811 | 14,600 | 14,961 | 13,992 | |
| | % Capacity Margin | 25.2% | 26.9% | 28.6% | 27.6% | 26.6% | 25.6% | 26.7% | 24.9% | 25.1% | 23.5% | |
| MAAC | Capability | 47,859 | 49,049 | 49,999 | 49,998 | 49,741 | 49,741 | 49,837 | 50,159 | 50,336 | 50,171 | 0.5% |
| | Peak Load | 35,610 | 36,040 | 36,350 | 36,790 | 37,150 | 37,540 | 37,910 | 38,340 | 38,800 | 39,300 | 1.1% |
| | Installed Margin | 12,249 | 13,009 | 13,649 | 13,208 | 12,591 | 12,201 | 11,927 | 11,819 | 11,536 | 10,871 | |
| | % Capacity Margin | 25.6% | 26.5% | 27.3% | 26.4% | 25.3% | 24.5% | 23.9% | 23.6% | 22.9% | 21.7% | |
| ECAR | Capability | 89,855 | 95,330 | 95,380 | 96,991 | 97,943 | 98,921 | 101,128 | 101,543 | 103,267 | 104,108 | 1.6% |
| | Peak Load | 68,222 | 69,591 | 70,851 | 72,577 | 74,199 | 75,507 | 76,910 | 78,303 | 79,704 | 81,174 | 2.0% |
| | Installed Margin | 21,633 | 25,739 | 24,529 | 24,414 | 23,744 | 23,414 | 24,218 | 23,240 | 23,563 | 22,934 | |
| | % Capacity Margin | 24.1% | 27.0% | 25.7% | 25.2% | 24.2% | 23.7% | 23.9% | 22.9% | 22.8% | 22.0% | |
| SERC | Capability | 130,304 | 133,104 | 136,663 | 139,495 | 144,055 | 144,211 | 148,323 | 149,703 | 152,422 | 153,378 | 1.8% |
| | Peak Load | 97,317 | 100,086 | 101,913 | 105,344 | 108,085 | 110,831 | 113,416 | 116,125 | 119,028 | 121,894 | 2.5% |
| | Installed Margin | 32,987 | 33,018 | 34,750 | 34,151 | 35,970 | 33,380 | 34,907 | 33,578 | 33,394 | 31,484 | |
| | % Capacity Margin | 25.3% | 24.8% | 25.4% | 24.5% | 25.0% | 23.1% | 23.5% | 22.4% | 21.9% | 20.5% | |
| MAIN | Capability | 45,408 | 45,478 | 48,653 | 49,455 | 49,464 | 49,483 | 49,503 | 49,386 | 49,992 | 49,974 | 1.1% |
| | Peak Load | 35,155 | 35,662 | 36,207 | 36,801 | 37,380 | 37,975 | 38,609 | 39,235 | 39,852 | 40,498 | 1.6% |
| | Installed Margin | 10,253 | 9,816 | 12,446 | 12,654 | 12,084 | 11,508 | 10,894 | 10,151 | 10,140 | 9,476 | |
| | % Capacity Margin | 22.6% | 21.6% | 25.6% | 25.6% | 24.4% | 23.3% | 22.0% | 20.6% | 20.3% | 19.0% | |
| SPP | Capability | 65,541 | 67,703 | 67,559 | 67,280 | 66,692 | 66,742 | 69,022 | 68,975 | 70,749 | 71,894 | 1.0% |
| | Peak Load | 47,502 | 48,561 | 49,686 | 51,007 | 52,415 | 53,797 | 55,296 | 56,613 | 57,960 | 59,368 | 2.5% |
| | Installed Margin | 18,039 | 19,142 | 17,873 | 16,273 | 14,277 | 12,945 | 13,726 | 12,362 | 12,789 | 12,526 | |
| | % Capacity Margin | 27.5% | 28.3% | 26.5% | 24.2% | 21.4% | 19.4% | 19.9% | 17.9% | 18.1% | 17.4% | |
| ERCOT | Capability | 45,022 | 47,440 | 51,179 | 52,455 | 54,000 | 55,575 | 57,323 | 58,922 | 61,270 | 63,117 | 3.8% |
| | Peak Load | 38,464 | 39,663 | 40,809 | 42,372 | 43,917 | 45,446 | 46,969 | 48,660 | 50,612 | 52,408 | 3.5% |
| | Installed Margin | 6,558 | 7,777 | 10,370 | 10,083 | 10,083 | 10,129 | 10,354 | 10,262 | 10,658 | 10,709 | |
| | % Capacity Margin | 14.6% | 16.4% | 20.3% | 19.2% | 18.7% | 18.2% | 18.1% | 17.4% | 17.4% | 17.0% | |
| MAPP | Capability | 29,131 | 29,372 | 29,448 | 30,162 | 30,145 | 30,205 | 30,281 | 30,325 | 30,203 | 30,604 | 0.5% |
| | Peak Load | 21,813 | 22,395 | 22,870 | 23,407 | 23,964 | 24,530 | 24,948 | 25,460 | 25,983 | 26,538 | 2.2% |
| | Installed Margin | 7,318 | 6,977 | 6,578 | 6,755 | 6,181 | 5,675 | 5,333 | 4,865 | 4,220 | 4,066 | |
| | % Capacity Margin | 25.1% | 23.8% | 22.3% | 22.4% | 20.5% | 18.8% | 17.6% | 16.0% | 14.0% | 13.3% | |
| WSCC | Capability | 113,011 | 119,540 | 122,176 | 124,818 | 126,111 | 126,780 | 128,784 | 130,986 | 131,882 | 134,017 | 1.9% |
| | Peak Load | 81,399 | 83,151 | 85,834 | 87,657 | 89,558 | 91,658 | 93,556 | 95,734 | 97,865 | 100,125 | 2.3% |
| | Installed Margin | 31,612 | 36,389 | 36,342 | 37,161 | 36,553 | 35,122 | 35,228 | 35,252 | 34,017 | 33,892 | |
| | % Capacity Margin | 28.0% | 30.4% | 29.7% | 29.8% | 29.0% | 27.7% | 27.4% | 26.9% | 25.8% | 25.3% | |
| TOTAL UNITED STATES** | Capability | 619,143 | 642,208 | 658,052 | 667,779 | 675,282 | 678,812 | 693,336 | 698,727 | 709,768 | 716,772 | 1.6% |
| | Peak Load | 465,112 | 475,469 | 485,200 | 497,285 | 508,588 | 519,814 | 530,938 | 542,598 | 554,490 | 566,822 | 2.2% |
| | Installed Margin | 154,031 | 166,739 | 172,852 | 170,494 | 166,694 | 158,998 | 162,398 | 156,129 | 155,278 | 149,950 | |
| | % Capacity Margin | 24.9% | 26.0% | 26.3% | 25.5% | 24.7% | 23.4% | 23.4% | 22.3% | 21.9% | 20.9% | |

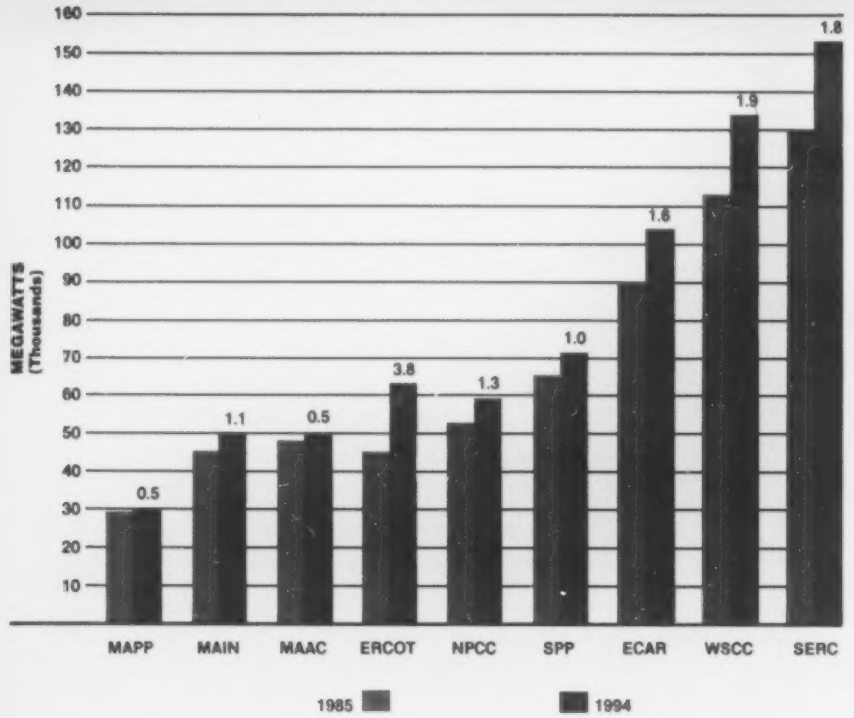
*Compound annual growth rate from 1985 to 1994.

**U.S. totals are meaningless and should not be used for policy purposes

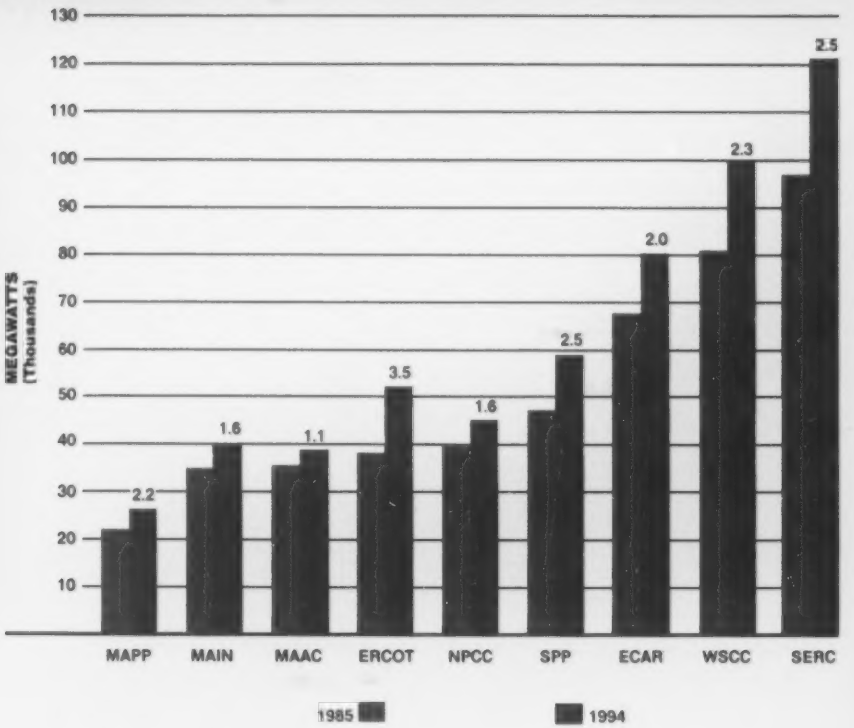
NOTE: For definitions of terms see page 5.

Capability equals NERC's "Planned Resources" series

## PROJECTED SUMMER CAPABILITIES
### Average Annual Growth Rates




## PROJECTED SUMMER PEAK LOADS
### Average Annual Growth Rates



# WINTER CAPABILITIES, PEAK LOADS, AND PERCENT CAPACITY MARGINS

## WINTER CAPABILITIES

Winter 1985/86 capability now projected for the entire electric utility industry is 642.8 thousand megawatts. The new projections for 1985/86 through 1993/94 for the nine regions taken together show reduced values, ranging from 1.2 percent to 0.4 percent below the winter capabilities expected for these years twelve months ago. NPCC is the only council that has consistently increased its winter capability projections over the whole period.

For winter 1994/95 the total capability of the industry is projected to reach 728.7 thousand megawatts. This value yields an average annual compound growth rate of 1.4 percent between the first and tenth forecast years.

The scheduled additions table on page 27 summarizes the number and aggregate ratings of new generating units that have so far been both ordered from the equipment manufacturers and been placed in the expansion program by having been assigned official scheduled dates of commercial operation. As of January 1, 1985, the furthest out year for which an ordered unit had been scheduled for operation was 1998.

## WINTER PEAK LOADS

As now projected, the winter 1985/86 peak load for the contiguous U.S. is expected to be 422.9 thousand megawatts, a decline for 3.1 percent below the winter 1984/85 peak load. The new projections for 1985/86 through 1993/94 for the nine regions taken together generally show reduced values, ranging to 0.8 percent below the winter peak loads expected for these years twelve months ago. Except for slight reductions in 1992 and 1993, NPCC and MAAC have raised all of their peak load projections between 0.1 percent and 3.1 percent. ERCOT and WSCC are the only councils that have consistently increased their winter peak load projections throughout the whole period.

For winter 1994/95, the furthest out year projected in this report, the expected peak load is 519.1 thousand megawatts. This represents an average annual increase of 2.3 percent between the first and tenth forecast years.

## WINTER PERCENT CAPACITY MARGINS

Compared with projected percent capacity margin values calculated on the same basis one year ago, regional winter percent margins reported in this survey are generally lower for all reliability councils except SERC. For the country as a whole, percent capacity margins are now projected to range from 34.6 percent for the winter of 1986/87 to 28.8 percent for 1994/95.

# Table 11/WINTER CAPABILITIES, PEAK LOADS, INSTALLED MARGINS & PERCENT CAPACITY MARGINS/1985/86-1994/95 PROJECTED (Megawatts)

| Regions | | 1985/86 | 1986/87 | 1987/88 | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 | 1993/94 | 1994/95 | Growth Rate 1985-1994* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | Capability | 54,943 | 57,909 | 57,969 | 58,009 | 58,051 | 59,693 | 59,587 | 59,544 | 60,394 | 60,132 | 1.0% |
| | Peak Load | 38,090 | 38,440 | 38,830 | 39,290 | 39,850 | 40,410 | 41,183 | 41,933 | 42,586 | 43,390 | 1.5% |
| | Installed Margin | 16,853 | 19,469 | 19,139 | 18,719 | 18,201 | 19,283 | 18,404 | 17,611 | 17,808 | 16,742 | |
| | % Capacity Margin | 30.7% | 33.6% | 33.0% | 32.3% | 31.4% | 32.3% | 30.9% | 29.6% | 29.5% | 27.8% | |
| MAAC | Capability | 50,860 | 51,262 | 52,331 | 52,330 | 52,025 | 52,320 | 51,911 | 52,189 | 52,616 | 52,442 | 0.3% |
| | Peak Load | 31,830 | 32,380 | 33,090 | 33,880 | 34,560 | 35,240 | 35,880 | 36,530 | 37,170 | 37,780 | 1.9% |
| | Installed Margin | 19,030 | 18,882 | 19,241 | 18,450 | 17,465 | 17,080 | 16,031 | 15,659 | 15,446 | 14,662 | |
| | % Capacity Margin | 37.4% | 36.8% | 36.8% | 35.3% | 33.6% | 32.6% | 30.9% | 30.0% | 29.4% | 28.0% | |
| ECAR | Capability | 96,310 | 96,829 | 97,606 | 99,478 | 100,276 | 101,151 | 102,905 | 104,220 | 105,607 | 106,097 | 1.1% |
| | Peak Load | 66,671 | 68,042 | 69,728 | 71,496 | 72,958 | 74,501 | 76,047 | 77,529 | 79,065 | 80,544 | 2.1% |
| | Installed Margin | 29,639 | 28,787 | 27,878 | 27,982 | 27,318 | 26,650 | 26,858 | 26,691 | 26,542 | 25,553 | |
| | % Capacity Margin | 30.8% | 29.7% | 28.6% | 28.1% | 27.2% | 26.3% | 26.1% | 25.6% | 25.1% | 24.1% | |
| SERC | Capability | 135,144 | 137,225 | 140,246 | 143,112 | 145,940 | 146,395 | 150,353 | 152,446 | 154,474 | 156,006 | 1.6% |
| | Peak Load | 95,964 | 97,773 | 100,491 | 102,527 | 104,699 | 106,796 | 109,593 | 111,997 | 114,613 | 117,088 | 2.2% |
| | Installed Margin | 39,180 | 39,452 | 39,755 | 40,585 | 41,241 | 39,599 | 40,760 | 40,449 | 39,861 | 38,918 | |
| | % Capacity Margin | 29.0% | 28.7% | 28.3% | 28.4% | 28.3% | 27.0% | 27.1% | 26.5% | 25.8% | 24.9% | |
| MAIN | Capability | 46,269 | 49,566 | 50,707 | 50,412 | 50,387 | 50,442 | 50,343 | 50,343 | 50,948 | 50,930 | 1.1% |
| | Peak Load | 28,896 | 29,442 | 30,103 | 30,769 | 31,442 | 32,152 | 32,841 | 33,519 | 34,233 | 34,958 | 2.1% |
| | Installed Margin | 17,373 | 20,124 | 20,604 | 19,643 | 18,945 | 18,290 | 17,502 | 16,824 | 16,715 | 15,972 | |
| | % Capacity Margin | 37.5% | 40.6% | 40.6% | 39.0% | 37.6% | 36.3% | 34.8% | 33.4% | 32.8% | 31.4% | |
| SPP | Capability | 66,975 | 67,538 | 67,669 | 66,913 | 66,599 | 66,882 | 69,496 | 70,144 | 71,503 | 71,924 | 0.8% |
| | Peak Load | 35,713 | 36,662 | 37,610 | 38,723 | 40,801 | 41,047 | 42,087 | 43,166 | 44,275 | 45,392 | 2.7% |
| | Installed Margin | 31,262 | 30,876 | 30,059 | 28,190 | 25,798 | 25,835 | 27,409 | 26,978 | 27,228 | 26,532 | |
| | % Capacity Margin | 46.7% | 45.7% | 44.4% | 42.1% | 38.7% | 38.6% | 39.4% | 38.5% | 38.1% | 36.9% | |
| ERCOT | Capability | 46,488 | 48,407 | 51,644 | 52,885 | 55,035 | 56,327 | 58,414 | 60,235 | 62,404 | 64,568 | 3.7% |
| | Peak Load | 29,828 | 30,595 | 32,049 | 33,564 | 35,068 | 36,745 | 38,441 | 40,052 | 41,859 | 43,581 | 4.3% |
| | Installed Margin | 16,660 | 17,812 | 19,595 | 19,321 | 19,967 | 19,582 | 19,973 | 20,183 | 20,545 | 20,987 | |
| | % Capacity Margin | 35.8% | 36.8% | 37.9% | 36.5% | 36.3% | 34.8% | 34.2% | 33.5% | 32.9% | 32.5% | |
| MAPP | Capability | 28,869 | 29,421 | 29,946 | 30,022 | 30,064 | 30,323 | 30,287 | 30,206 | 31,012 | 31,397 | 0.9% |
| | Peak Load | 19,607 | 19,960 | 20,458 | 21,078 | 21,617 | 22,099 | 22,578 | 23,096 | 23,623 | 24,051 | 2.3% |
| | Installed Margin | 9,262 | 9,461 | 9,488 | 8,944 | 8,447 | 8,224 | 7,709 | 7,110 | 7,389 | 7,346 | |
| | % Capacity Margin | 32.1% | 32.2% | 31.7% | 29.8% | 28.1% | 27.1% | 25.5% | 23.5% | 23.8% | 23.4% | |
| WSCC | Capability | 116,947 | 121,492 | 125,638 | 126,760 | 127,847 | 128,234 | 130,071 | 132,916 | 134,876 | 135,195 | 1.6% |
| | Peak Load | 76,340 | 78,387 | 80,814 | 82,457 | 84,254 | 85,942 | 88,055 | 90,155 | 92,071 | 92,348 | 2.1% |
| | Installed Margin | 40,607 | 43,105 | 44,824 | 44,303 | 43,593 | 42,292 | 42,016 | 42,761 | 42,805 | 42,847 | |
| | % Capacity Margin | 34.7% | 35.5% | 35.7% | 35.0% | 34.1% | 33.0% | 32.3% | 32.2% | 31.7% | 31.7% | |
| TOTAL UNITED STATES** | Capability | 642,805 | 659,649 | 673,756 | 679,921 | 686,224 | 691,767 | 703,367 | 712,243 | 723,834 | 728,691 | 1.4% |
| | Peak Load | 422,939 | 431,681 | 443,173 | 453,784 | 465,249 | 474,932 | 486,705 | 497,977 | 509,495 | 519,132 | 2.3% |
| | Installed Margin | 219,866 | 227,968 | 230,583 | 226,137 | 220,975 | 216,835 | 216,662 | 214,266 | 214,339 | 209,559 | |
| | % Capacity Margin | 34.2% | 34.6% | 34.2% | 33.3% | 32.2% | 31.3% | 30.8% | 30.1% | 29.6% | 28.8% | |

*Compound annual growth rate from 1985/86 to 1994/95

**U.S. totals are meaningless and should not be used for policy purposes.

NOTE: For definitions of terms see page 5.

# RELATIONSHIP BETWEEN SUMMER AND WINTER PEAK LOADS 1985-1994

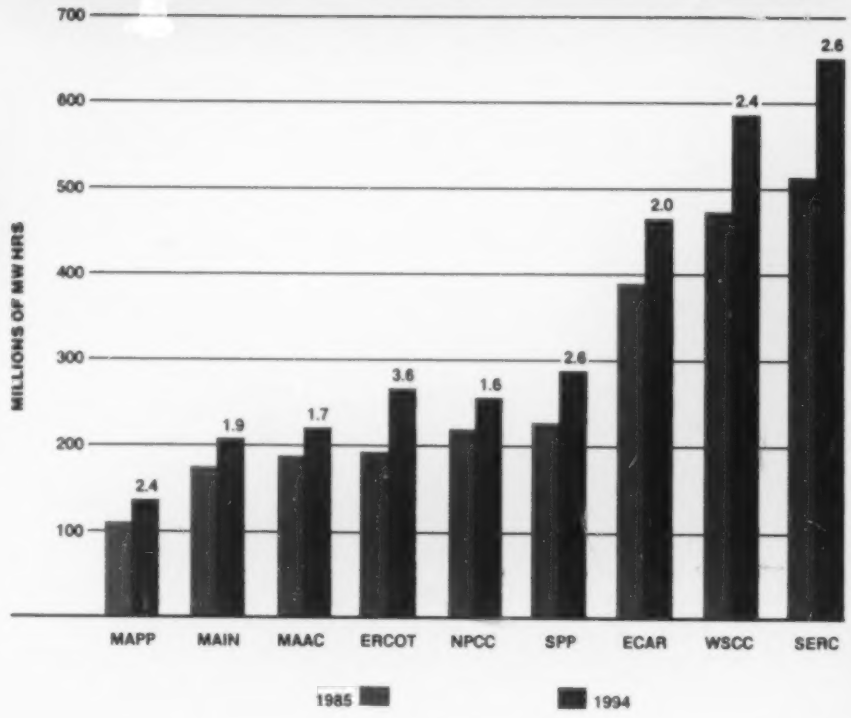
The relationship between the summer and winter peak loads in the different regions of the country, and also for the contiguous United States, are shown in the accompanying table, where the summer peak load in each case is expressed as a percentage of the winter peak load for the following season.

Though there are some changes from year to year in the regional ratios, the movements are generally offsetting to the extent that the summer/winter ratio for the sum of the nine regions calculates to either 110 percent or 109 percent throughout the ten-year period.

## Table 12/SUMMER PEAK LOADS EXPRESSED AS PERCENTAGE OF PEAK LOADS FOR THE FOLLOWING WINTER/1985-1994

| Regions | 85/86 | 86/87 | 87/88 | 88/89 | 89/90 | 90/91 | 91/92 | 92/93 | 93/94 | 94/95 |
|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | 104 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 | 105 |
| MAAC | 112 | 111 | 110 | 109 | 107 | 107 | 106 | 105 | 104 | 104 |
| ECAR | 102 | 102 | 102 | 102 | 102 | 101 | 101 | 101 | 101 | 101 |
| SERC | 101 | 102 | 101 | 103 | 103 | 104 | 103 | 104 | 104 | 104 |
| MAIN | 122 | 121 | 120 | 120 | 119 | 118 | 118 | 117 | 116 | 116 |
| SPP | 133 | 132 | 132 | 132 | 128 | 131 | 131 | 131 | 131 | 131 |
| ERCOT | 129 | 130 | 127 | 126 | 125 | 124 | 122 | 121 | 121 | 120 |
| MAPP | 111 | 112 | 112 | 111 | 111 | 111 | 110 | 110 | 110 | 110 |
| WSCC | 107 | 106 | 106 | 106 | 106 | 107 | 106 | 106 | 106 | 108 |
| U.S.TOTAL | 110 | 110 | 109 | 110 | 109 | 109 | 109 | 109 | 109 | 109 |

## REGIONAL NET ANNUAL ENERGY Average Annual Growth Rates



# ANNUAL ENERGY REQUIREMENTS AND ANNUAL LOAD FACTORS 1985-1994

Calendar-year energy requirements by region and for the total of the lower forty-eight states are shown in Table 13. The corresponding annual load factors are given in Table 14. The energy requirement represents utility generation plus megawatthours received from all outside sources, including net imports from other countries and energy from certain industrial installations which are interconnected and coordinated with the utility systems.

The present projections of energy requirements for the contiguous United States for the years 1985 through 1993 are higher in the earlier years and below the values predicted in the 1983 Electric Power Annual Report from 1989 on. NPCC, MAAC, MAIN and WSCC raised all of their annual projected energy values; SERC and SPP's projections were consistently lower and the other regions had a mixture of increased and decreased projections for various years. For 1994, the new furthest out year, the projected megawatthour requirement is 3.1 billion megawatthours. This represents an average annual increase of 2.4 percent between the first and tenth forecast years.

## Table 13/ANNUAL ENERGY REQUIREMENTS (Megawatthours in Thousands)/1985-1994

| Regions | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | Annualized Growth Rate 1985-1994* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | 221,149 | 225,249 | 227,790 | 231,276 | 234,176 | 237,579 | 242,091 | 247,011 | 250,851 | 255,987 | 1.6% |
| MAAC | 188,274 | 191,443 | 192,725 | 196,609 | 200,431 | 204,257 | 208,105 | 211,969 | 215,810 | 219,663 | 1.7% |
| ECAR | 390,900 | 397,800 | 405,400 | 416,600 | 426,100 | 433,600 | 441,600 | 449,300 | 457,100 | 465,200 | 2.0% |
| SERC | 517,136 | 530,580 | 544,081 | 564,095 | 579,042 | 596,758 | 610,898 | 625,633 | 639,586 | 654,288 | 2.6% |
| MAIN | 174,550 | 177,993 | 181,313 | 184,560 | 188,077 | 191,786 | 195,528 | 199,187 | 202,899 | 206,640 | 1.9% |
| SPP | 228,195 | 232,887 | 238,658 | 245,242 | 252,222 | 259,140 | 266,077 | 274,073 | 281,264 | 288,376 | 2.6% |
| ERCOT | 193,347 | 199,590 | 204,543 | 212,127 | 220,366 | 229,187 | 238,149 | 247,401 | 256,875 | 266,528 | 3.6% |
| MAPP | 109,224 | 112,458 | 114,852 | 117,819 | 120,722 | 123,872 | 126,750 | 129,750 | 132,839 | 135,780 | 2.4% |
| WSCC | 476,608 | 490,553 | 504,263 | 516,154 | 526,927 | 539,604 | 551,054 | 563,913 | 575,907 | 588,150 | 2.4% |
| TOTAL U.S. | 2,499,383 | 2,558,553 | 2,613,625 | 2,684,482 | 2,748,063 | 2,815,783 | 2,880,252 | 2,948,237 | 3,013,131 | 3,080,612 | 2.4% |

*Average annual growth rate from 1985 to 1994

## Table 14/ANNUAL LOAD FACTOR, %/1985-1994

| Regions | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|
| NPCC | 63.7 | 63.8 | 63.9 | 63.7 | 63.8 | 63.8 | 63.8 | 63.7 | 64.1 | 64.2 |
| MAAC | 60.4 | 60.6 | 60.5 | 60.8 | 61.6 | 62.1 | 62.7 | 62.9 | 63.5 | 63.8 |
| ECAR | 65.4 | 65.3 | 65.3 | 65.3 | 65.6 | 65.6 | 65.5 | 65.3 | 65.5 | 65.4 |
| SERC | 60.7 | 60.5 | 60.9 | 61.0 | 61.2 | 61.5 | 61.5 | 61.3 | 61.3 | 61.3 |
| MAIN | 56.7 | 57.0 | 57.2 | 57.1 | 57.4 | 57.7 | 57.8 | 57.8 | 58.1 | 58.2 |
| SPP | 54.8 | 54.7 | 54.8 | 54.7 | 54.9 | 55.0 | 54.9 | 55.1 | 55.4 | 55.5 |
| ERCOT | 57.4 | 57.4 | 57.2 | 57.0 | 57.3 | 57.6 | 57.9 | 57.9 | 57.9 | 58.1 |
| MAPP | 57.2 | 57.3 | 57.3 | 57.3 | 57.5 | 57.6 | 58.0 | 58.0 | 58.4 | 58.4 |
| WSCC | 66.8 | 67.3 | 67.1 | 67.0 | 67.2 | 67.2 | 67.2 | 67.1 | 67.2 | 67.1 |
| TOTAL U.S. | 61.3 | 61.4 | 61.5 | 61.5 | 61.7 | 61.8 | 61.9 | 61.9 | 62.0 | 62.0 |

## FUTURE EXPANSION PROGRAM

Table 16 shows that as of January 1, 1985, the electric power systems serving the contiguous United States had on order with both domestic and foreign manufacturers, and scheduled for commercial operation during 1985 and later years, a total of 90.4 thousand megawatts. This included 39 hydraulic units of both conventional and pumped-storage type, totaling 5.5 thousand megawatts. The thermal units include steam turbine-generators, of both conventional and nuclear types, a combustion turbine-generator, and three diesel engine-generators. Some of this capacity is on site and being installed; the remainder is under manufacture or in the form of firm orders.

During 1985, 15 nuclear power units are scheduled for commercial operation. These 15 units have an aggregate capability of 16.6 thousand megawatts. As of January 1, 1985, there are 26 additional nuclear units on order and scheduled for commercial operation in 1986 and later in the contiguous United States, having an aggregate capability of 29.6 thousand megawatts. These units are included in the regional listing designated Table 17.

An indeterminate number of units, amounting to several thousand megawatts, are also on order but are either awaiting their first assignment of a scheduled date of commercial operation by the utility systems, or were once scheduled and have since been removed from the expansion program. It is probable that the majority of the orders in the second category [being held open as options by the manufacturers] will not be reactivated.

Table 15 shows that of the total 84.8 thousand megawatts of steam turbine-generators on order as of January 1, 1985, and scheduled for service, nuclear and conventional units in sizes 700 megawatts and larger account for 71.1 percent of the total. Among the units in the less than 100 megawatt range, there are three coal-fired steam turbine-generators aggregating 115 megawatts, four geothermal units with a total capability of 169 megawatts, and two solar units totaling 40 megawatts.

### Table 15/NUMBER AND AGGREGATE CAPABILITY OF STEAM TURBINE-GENERATORS IN THE EXPANSION PROGRAM GROUPED ACCORDING TO SIZE RANGE As of January 1, 1985

| Size Range, MW | No. Of Units | Aggregate Capability MW | Percent of Total |
|---|---|---|---|
| 1,300 MW and Larger | 2 | 2,600 | 3.1 |
| 1,200 to 1,299 | 12 | 14,931 | 17.6 |
| 1,100 to 1,199 | 17 | 19,397 | 22.9 |
| 1,000 to 1,099 | 7 | 7,486 | 8.8 |
| 900 to 999 | 3 | 2,790 | 3.3 |
| 800 to 899 | 7 | 5,658 | 6.7 |
| 700 to 799 | 10 | 7,398 | 8.7 |
| 600 to 699 | 16 | 10,224 | 12.1 |
| 500 to 599 | 13 | 6,743 | 8.0 |
| 400 to 499 | 9 | 3,964 | 4.7 |
| 300 to 399 | 7 | 2,449 | 2.9 |
| 200 to 299 | 2 | 500 | 0.6 |
| 100 to 199 | 3 | 330 | 0.4 |
| Under 100 | 9 | 324 | 0.4 |
| TOTAL STEAM UNITS | 117 | 84,794 | 100.0 |

# Table 16/SCHEDULED ADDITIONS TO ELECTRIC GENERATING CAPABILITY BASED ON SCHEDULED DATES OF COMMERCIAL OPERATION AS OF JANUARY 1, 1985
## In Terms of Capability Ratings of the Units

| | THERMAL | | | | | | | | HYDRAULIC | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Steam Turbine-Generators | | | | Combustion Turbine-Generators | | Diesel Engine-Generators | | Conventional | | Pumped-Storage | | Total | |
| | Nuclear | | Conventional | | | | | | | | | | | |
| | No. of Units | MW | No. of Units | MW | No. of Units | MW | No. of Units | MW | No. of Units | MW | No. of Units | MW | No. of Units | MW |
| TOTAL SCHEDULED | 41 | 46,246 | 76 | 38,548 | 1 | 50 | 3 | 18 | 25 | 1,378 | 14 | 4,148 | 160 | 90,388 |
| SCHEDULED ADDITIONS BY YEARS – as of January 1, 1985 | | | | | | | | | | | | | | |
| 1985 | 15 | 16,573 | 19 | 6,511 | 1 | 50 | 2 | 11 | 20 | 1,074 | 6 | 2,100 | 63 | 26,319 |
| 1986 | 10 | 10,957 | 11 | 5,125 | – | – | 1 | 7 | 5 | 304 | – | – | 27 | 16,393 |
| 1987 | 8 | 9,095 | 5 | 2,523 | – | – | – | – | – | – | – | – | 13 | 11,618 |
| 1988 | 1 | 1,150 | 6 | 3,565 | – | – | – | – | – | – | 1 | 200 | 8 | 4,915 |
| 1989 | 2 | 2,463 | 3 | 1,804 | – | – | – | – | – | – | – | – | 5 | 4,267 |
| 1990 | 1 | 1,055 | 3 | 1,189 | – | – | – | – | – | – | – | – | 4 | 2,244 |
| 1991 | 2 | 2,463 | 7 | 4,871 | – | – | – | – | – | – | 5 | 1,348 | 14 | 8,682 |
| 1992 | 1 | 1,240 | 4 | 2,390 | – | – | – | – | – | – | 2 | 500 | 7 | 4,130 |
| 1993 | 1 | 1,250 | 7 | 4,490 | – | – | – | – | – | – | – | – | 8 | 5,740 |
| 1994 | – | – | 2 | 1,290 | – | – | – | – | – | – | – | – | 2 | 1,290 |
| 1995 | – | – | 4 | 1,865 | – | – | – | – | – | – | – | – | 4 | 1,865 |
| 1996 | – | – | 1 | 500 | – | – | – | – | – | – | – | – | 1 | 500 |
| 1997 | – | – | 3 | 1,925 | – | – | – | – | – | – | – | – | 3 | 1,925 |
| 1998 | – | – | 1 | 500 | – | – | – | – | – | – | – | – | 1 | 500 |
| 1999 | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| SCHEDULED ADDITIONS BY REGION – as of January 1, 1985 | | | | | | | | | | | | | | |
| NPCC | 4 | 4,189 | – | – | – | – | – | – | 1 | 8 | – | – | 5 | 4,197 |
| MAAC | 4 | 4,227 | 4 | 2,265 | – | – | – | – | 5 | 190 | – | – | 13 | 6,682 |
| ECAR | 3 | 3,131 | 10 | 6,162 | – | – | 1 | 7 | – | – | – | – | 14 | 9,300 |
| SERC | 9 | 10,270 | 11 | 6,718 | – | – | – | – | 8 | 588 | 13 | 3,948 | 41 | 21,524 |
| MAIN | 5 | 5,430 | 2 | 960 | – | – | 2 | 11 | – | – | – | – | 9 | 6,401 |
| SPP | 5 | 5,694 | 9 | 5,468 | – | – | – | – | – | – | – | – | 14 | 11,162 |
| ERCOT | 4 | 4,800 | 12 | 7,736 | – | – | – | – | – | – | – | – | 16 | 12,536 |
| MAPP | – | – | 4 | 1,929 | – | – | – | – | 1 | 38 | – | – | 5 | 1,967 |
| WSCC | 7 | 8,505 | 24 | 7,310 | 1 | 50 | – | – | 10 | 554 | 1 | 200 | 43 | 16,619 |
| SCHEDULED ADDITIONS BY OWNERSHIP – as of January 1, 1985 | | | | | | | | | | | | | | |
| INVESTOR-OWNED | 35 | 38,976 | 57 | 31,626 | – | – | – | – | 10 | 486 | 14 | 4,148 | 116 | 75,236 |
| FEDERAL | 4 | 4,780 | – | – | – | – | – | – | 4 | 300 | – | – | 8 | 5,080 |
| MUNICIPAL | – | – | 7 | 3,038 | 1 | 50 | 3 | 18 | 8 | 528 | – | – | 19 | 3,634 |
| COOPERATIVE | – | – | 5 | 1,924 | – | – | – | – | – | – | – | – | 5 | 1,924 |
| STATE AND LOCAL | 2 | 2,490 | 7 | 1,960 | – | – | – | – | 3 | 64 | – | – | 12 | 4,514 |

# Table 17/SCHEDULED ADDITIONS TO ELECTRIC GENERATING CAPABILITY Based on Scheduled Dates of Commercial Operation as of January 1, 1985

Includes all electric generating units 4,000 kw and larger on order and scheduled for service by the U.S. Electric Power Systems.

SYMBOLS:

- Investor-Owned . . . . . I
- Federal . . . . . F
- Municipal . . . . . M
- Cooperative . . . . . C
- State & Local . . . . . SL
- Thermal
  - Conventional steam turbine-generator . . . . . T
  - Nuclear steam turbine-generator . N
  - Combustion turbine-generator . . G
  - Diesel engine-generator . . . . . D
- Hydraulic
  - Hydraulic turbine-generator . . . . . H
- Pumped-Storage
  - Pumped-Storage turbine-generator . . . . . S
  - Reversible pumped-storage turbine-generator . . . . . R
- Combined-Cycle
  - Combustion turbine-generator for combined-cycle operation . . . . . GC
  - Conventional steam turbine-generator for combined-cycle operation . . . . . TC

° Denotes units added to the expansion program since July 1, 1984.

+ Denotes multiple ownership of the unit. In such cases, the name of the participating power system in whose service area the installation will be located is shown. In case the location does not fall within the service area of any of the participants, the name of the power system shown is the first in alphabetical order among the major participants.

NOTES: Megawatts shown for individual generating units represent, in most cases, the net operating capability expected by the power systems; in other cases they represent the manufacturer's nameplate rating of the unit.

| REGION | S Y S T E M | U N I T | OWNER-SHIP | TYPE | FOSSIL FUELS | MW of NET EXPECTED CAPABILITY | SKED YEAR OPTN |
|---|---|---|---|---|---|---|---|
| NPCC | CENTRAL MAINE POWER CO | HIRAM | I | H | | 8 | 1985 |
| NPCC | LONG ISLAND LIGHTING CO | SHOREHAM NO 1 | I | N | | 809 | 1985 |
| NPCC | +NIAGARA MOHAWK POWER CORP | NINE MILE POINT NO 2 | I | N | | 1,080 | 1986 |
| NPCC | +NORTHEAST UTILITIES | MILLSTONE POINT NO 3 | I | N | | 1,150 | 1986 |
| NPCC | +PUBLIC SERVICE CO OF NEW HAMPSHIRE | SEABROOK NO 1 | I | N | | 1,150 | 1986 |
| 5 | | | | | | | |
| MAAC | BALTIMORE GAS & ELECTRIC CO | BRANDON SHORES NO 2 | I | T | Oil/Coal | 640 | 1992 |
| MAAC | DELMARVA POWER & LIGHT CO | VIENNA NO 9 | I | T | Coal | 375 | 1995 |
| MAAC | GENERAL PUBLIC UTILITIES | COAL NO 1 | I | T | Coal | 625 | 1993 |
| MAAC | GENERAL PUBLIC UTILITIES | COAL NO 2 | I | T | Coal | 625 | 1997 |
| MAAC | +PENNSYLVANIA POWER & LIGHT CO | SUSQUEHANNA NO 2 | I | N | | 1,050 | 1985 |
| MAAC | PHILADELPHIA ELECTRIC CO | LIMERICK NO 1 | I | N | | 1,055 | 1985 |
| MAAC | PHILADELPHIA ELECTRIC CO | LIMERICK NO 2 | I | N | | 1,055 | 1990 |
| MAAC | +PUBLIC SERVICE ELECTRIC & GAS CO | HOPE CREEK NO 1 | I | N | | 1,067 | 1986 |
| MAAC | SAFE HARBOR WATER CORPORATION | SAFE HARBOR NO 8 | I | H | | 38 | 1985 |
| MAAC | SAFE HARBOR WATER CORPORATION | SAFE HARBOR NO 9 | I | H | | 38 | 1986 |
| MAAC | SAFE HARBOR WATER CORPORATION | SAFE HARBOR NO 10 | I | H | | 38 | 1985 |
| MAAC | SAFE HARBOR WATER CORPORATION | SAFE HARBOR NO 11 | I | H | | 38 | 1986 |
| MAAC | SAFE HARBOR WATER CORPORATION | SAFE HARBOR NO 12 | I | H | | 38 | 1985 |
| 13 | | | | | | | |
| ECAR | AMERICAN ELECTRIC POWER CO | ROCKPORT NO 2 | I | T | Coal | 1,300 | 1988 |
| ECAR | oBAY CITY MICHIGAN | MUNICIPAL | M | D | | 7 | 1986 |
| ECAR | oCINCINNATI GAS & ELECTRIC CO | ZIMMER | I | T | Coal | 1,300 | 1991 |
| ECAR | +CLEVELAND ELECTRIC ILLUMINATING CO | PERRY NO 1 | I | N | | 1,205 | 1985 |
| ECAR | DETROIT EDISON COMPANY | BELLE RIVER NO 2 | I | T | Coal | 676 | 1985 |
| ECAR | +DETROIT EDISON COMPANY | FERMI NO 2 | I | N | | 1,093 | 1985 |
| ECAR | +DUQUESNE LIGHT COMPANY | BEAVER VALLEY NO 2 | I | N | | 833 | 1987 |
| ECAR | EAST KENTUCKY POWER COOP | SMITH NO 1 | C | T | Coal | 600 | 1992 |
| ECAR | INDIANAPOLIS POWER & LIGHT CO | PETERSBURG NO 4 | I | T | Coal | 515 | 1986 |
| ECAR | KENTUCKY UTILITIES CO | HANCOCK NO 1 | I | T | Coal | 650 | 1993 |
| ECAR | LOUISVILLE GAS & ELECTRIC CO | TRIMBLE COUNTY NO 1 | I | T | Coal | 495 | 1988 |
| ECAR | NORTHERN INDIANA PUBLIC SERVICE CO | SCHAHFER NO 18 | I | T | Coal | 344 | 1986 |
| ECAR | SOUTHERN INDIANA GAS & ELECTRIC CO | BROWN NO 2 | I | T | Coal | 250 | 1986 |
| ECAR | WYANDOTTE MICHIGAN | WYANDOTTE NO 8 | M | T | Coal | 32 | 1986 |
| 14 | | | | | | | |

| REGION | S Y S T E M | U N I T | OWNER-SHIP | TYPE | FOSSIL FUELS | MW of NET EXPECTED CAPABILITY | SKED YEAR OPTN |
|---|---|---|---|---|---|---|---|
| SERC | ALABAMA POWER COMPANY | MILLER NO 2 | I | T | Coal | 666 | 1985 |
| SERC | ALABAMA POWER COMPANY | MILLER NO 3 | I | T | Coal | 666 | 1989 |
| SERC | ALABAMA POWER COMPANY | MILLER NO 4 | I | T | Coal | 666 | 1991 |
| SERC | ALABAMA POWER COMPANY | MITCHELL NO 5 | I | H | | 64 | 1985 |
| SERC | ALABAMA POWER COMPANY | MITCHELL NO 6 | I | H | | 64 | 1985 |
| SERC | ALABAMA POWER COMPANY | MITCHELL NO 7 | I | H | | 64 | 1985 |
| SERC | CAROLINA POWER & LIGHT CO | HARRIS NO 1 | I | N | | 900 | 1986 |
| SERC | CAROLINA POWER & LIGHT CO | MAYO NO 2 | I | T | Coal | 720 | 1991 |
| SERC | oDUKE POWER COMPANY | BAD CREEK NO 1 | I | R | | 250 | 1991 |
| SERC | oDUKE POWER COMPANY | BAD CREEK NO 2 | I | R | | 250 | 1991 |
| SERC | oDUKE POWER COMPANY | BAD CREEK NO 3 | I | R | | 250 | 1992 |
| SERC | oDUKE POWER COMPANY | BAD CREEK NO 4 | I | R | | 250 | 1992 |
| SERC | DUKE POWER COMPANY | CATAWBA NO 1 | I | N | | 1,145 | 1985 |
| SERC | DUKE POWER COMPANY | CATAWBA NO 2 | I | N | | 1,145 | 1987 |
| SERC | GEORGIA POWER COMPANY | BARTLETTS FERRY 5 & 6 | I | H | | 96 | 1985 |
| SERC | GEORGIA POWER COMPANY | ROCKY MOUNTAIN NO 1 | I | R | | 283 | 1991 |
| SERC | GEORGIA POWER COMPANY | ROCKY MOUNTAIN NO 2 | I | R | | 283 | 1991 |
| SERC | GEORGIA POWER COMPANY | ROCKY MOUNTAIN NO 3 | I | R | | 283 | 1991 |
| SERC | +GEORGIA POWER COMPANY | SCHERER NO 3 | I | T | Coal | 808 | 1987 |
| SERC | +GEORGIA POWER COMPANY | SCHERER NO 4 | I | T | Coal | 808 | 1989 |
| SERC | +GEORGIA POWER COMPANY | VOGTLE NO 1 | I | N | | 1,150 | 1987 |
| SERC | +GEORGIA POWER COMPANY | VOGTLE NO 2 | I | N | | 1,150 | 1988 |
| SERC | +JACKSONVILLE FLORIDA | ST JOHNS RIVER PARK 1 | M | T | Coal | 525 | 1987 |
| SERC | +JACKSONVILLE FLORIDA | ST JOHNS RIVER PARK 2 | M | T | Coal | 525 | 1988 |
| SERC | +ORLANDO FLORIDA | STANTON NO 1 | M | T | Coal | 415 | 1987 |
| SERC | SOUTH CAROLINA PUBLIC SERVICE AUTHY | CROSS NO 1 | SL | T | Coal | 500 | 1993 |
| SERC | TAMPA ELECTRIC COMPANY | BIG BEND NO 4 | I | T | Coal | 419 | 1985 |
| SERC | TENNESSEE VALLEY AUTHORITY | BELLEFONTE NO 1 | F | N | | 1,213 | 1989 |
| SERC | TENNESSEE VALLEY AUTHORITY | BELLEFONTE NO 2 | F | N | | 1,213 | 1991 |
| SERC | TENNESSEE VALLEY AUTHORITY | WATTS BAR NO 1 | F | N | | 1,177 | 1985 |
| SERC | TENNESSEE VALLEY AUTHORITY | WATTS BAR NO 2 | F | N | | 1,177 | 1987 |
| SERC | U S ARMY CORPS OF ENGINEERS | R B RUSSELL NO 1 | F | H | | 75 | 1985 |
| SERC | U S ARMY CORPS OF ENGINEERS | R B RUSSELL NO 2 | F | H | | 75 | 1985 |
| SERC | U S ARMY CORPS OF ENGINEERS | R B RUSSELL NO 3 | F | H | | 75 | 1985 |
| SERC | U S ARMY CORPS OF ENGINEERS | R B RUSSELL NO 4 | F | H | | 75 | 1985 |

| REGION | S Y S T E M | U N I T | OWNER-SHIP | TYPE | FOSSIL FUELS | MW of NET EXPECTED CAPABILITY | SKED YEAR OPTN |
|---|---|---|---|---|---|---|---|
| SERC | +VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 1 | I | R | | 350 | 1985 |
| SERC | +VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 2 | I | R | | 350 | 1985 |
| SERC | +VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 3 | I | R | | 350 | 1985 |
| SERC | +VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 4 | I | R | | 350 | 1985 |
| SERC | +VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 5 | I | R | | 350 | 1985 |
| SERC | +VIRGINIA ELECTRIC & POWER CO | BATH COUNTY NO 6 | I | R | | 350 | 1985 |
| 41 | | | | | | | |
| MAIN | COMMONWEALTH EDISON CO | BRAIDWOOD NO 1 | I | N | | 1,120 | 1986 |
| MAIN | COMMONWEALTH EDISON CO | BRAIDWOOD NO 2 | I | N | | 1,120 | 1987 |
| MAIN | COMMONWEALTH EDISON CO | BYRON NO 1 | I | N | | 1,120 | 1985 |
| MAIN | COMMONWEALTH EDISON CO | BYRON NO 2 | I | N | | 1,120 | 1986 |
| MAIN | +ILLINOIS POWER COMPANY | CLINTON NO 1 | I | N | | 950 | 1986 |
| MAIN | MANITOWOC WISCONSIN | DIESEL NO 1 | M | D | | 5 | 1985 |
| MAIN | MANITOWOC WISCONSIN | DIESEL NO 2 | M | D | | 5 | 1985 |
| MAIN | WISCONSIN ELECTRIC POWER CO | PLEASANT PRAIRIE NO 2 | I | T | Coal | 580 | 1985 |
| MAIN | +WISCONSIN POWER & LIGHT CO | EDGEWATER NO 5 | I | T | Coal | 380 | 1985 |
| 9 | | | | | | | |
| SPP | GRAND RIVER DAM AUTHORITY | CHOUTEAU NO 2 | SL | T | Coal | 490 | 1985 |
| SPP | GULF STATES UTILITIES | NELSON NO 5 | I | T | Coal | 540 | 1994 |
| SPP | +GULF STATES UTILITIES | RIVER BEND NO 1 | I | N | | 940 | 1985 |
| SPP | +KANSAS GAS & ELECTRIC CO | WOLF CREEK NO 1 | I | N | | 1,150 | 1985 |
| SPP | LOUISIANA POWER & LIGHT CO | WATERFORD NO 3 | I | N | | 1,104 | 1985 |
| SPP | LOUISIANA POWER & LIGHT CO | WILTON NO 1 | I | T | Coal | 800 | 1993 |
| SPP | LOUISIANA POWER & LIGHT CO | WILTON NO 2 | I | T | Coal | 800 | 1997 |
| SPP | +MISSISSIPPI POWER & LIGHT CO | GRAND GULF NO 1 | I | N | | 1,250 | 1985 |
| SPP | +MISSISSIPPI POWER & LIGHT CO | GRAND GULF NO 2 | I | N | | 1,250 | 1991 |
| SPP | +SOUTHWESTERN ELECTRIC POWER CO | DOLET HILLS NO 1 | I | T | Coal | 640 | 1986 |
| SPP | +SOUTHWESTERN PUBLIC SERVICE CO | PIRKEY NO 1 | I | T | Coal | 640 | 1985 |
| SPP | SOUTHWESTERN PUBLIC SERVICE CO | SO PLAINS STA NO 6 | I | T | Coal | 525 | 1990 |
| SPP | SOUTHWESTERN PUBLIC SERVICE CO | SO PLAINS STA NO 7 | I | T | Coal | 525 | 1993 |
| SPP | SOUTHWESTERN PUBLIC SERVICE CO | TOLK NO 2 | I | T | Coal/Oil/Gas | 508 | 1985 |
| 14 | | | | | | | |

| REGION | S Y S T E M | U N I T | OWNER-SHIP | TYPE | FOSSIL FUELS | MW of NET EXPECTED CAPABILITY | SKED YEAR OPTN |
|---|---|---|---|---|---|---|---|
| ERCOT | +BRAZOS ELECTRIC POWER COOP | SAN MIGUEL NO 2 | C | T | Coal/Oil | 400 | 1992 |
| ERCOT | +CENTRAL POWER & LIGHT CO | COLETO CREEK NO 2 | I | T | Coal | 640 | 1993 |
| ERCOT | HOUSTON LIGHTING & POWER CO | LIMESTONE NO 1 | I | T | Coal | 728 | 1985 |
| ERCOT | HOUSTON LIGHTING & POWER CO | LIMESTONE NO 2 | I | T | Coal | 728 | 1986 |
| ERCOT | HOUSTON LIGHTING & POWER CO | MALAKOFF NO 1 | I | T | Coal | 600 | 1990 |
| ERCOT | HOUSTON LIGHTING & POWER CO | MALAKOFF NO 2 | I | T | Coal | 600 | 1991 |
| ERCOT | +HOUSTON LIGHTING & POWER CO | SOUTH TEXAS NO 1 | I | N | | 1,250 | 1987 |
| ERCOT | +HOUSTON LIGHTING & POWER CO | SOUTH TEXAS NO 2 | I | N | | 1,250 | 1989 |
| ERCOT | +LOWER COLO RIVER AUTHORITY | FAYETTE NO 3 | SL | T | Coal | 400 | 1988 |
| ERCOT | +TEXAS UTILITIES CO SYSTEM | COMANCHE PEAK NO 1 | I | N | | 1,150 | 1986 |
| ERCOT | +TEXAS UTILITIES CO SYSTEM | COMANCHE PEAK NO 2 | I | N | | 1,150 | 1987 |
| ERCOT | +TEXAS UTILITIES CO SYSTEM | FOREST GROVE NO 1 | I | T | Coal | 750 | 1993 |
| ERCOT | +TEXAS UTILITIES CO SYSTEM | MARTIN LAKE NO 4 | I | T | Coal | 750 | 1994 |
| ERCOT | +TEXAS UTILITIES CO SYSTEM | TWIN OAK NO 1 | I | T | Coal | 750 | 1991 |
| ERCOT | +TEXAS UTILITIES CO SYSTEM | TWIN OAK NO 2 | I | T | Coal | 750 | 1992 |
| ERCOT | +WEST TEXAS UTILITIES | OKLAUNION NO1 | I | T | Coal | 640 | 1986 |
| 16 | | | | | | | |
| --- | | | | | | | |
| MAPP | +BASIN ELECTRIC POWER COOP | ANTELOPE VALLEY NO 2 | C | T | Coal | 460 | 1986 |
| MAPP | HIBBING MINNESOTA | MUNICIPAL | M | T | Sub-Bituminous | 19 | 1985 |
| MAPP | +IOWA ELECTRIC LIGHT & POWER CO | GUTHRIE COUNTY NO 1 | I | T | Coal | 650 | 1995 |
| MAPP | NEBRASKA PUBLIC POWER DISTRICT | KINGSLEY NO 1 | SL | H | | 38 | 1985 |
| MAPP | +NORTHERN STATES POWER CO | SHERBURNE COUNTY NO 3 | I | T | Coal | 800 | 1988 |
| 5 | | | | | | | |
| --- | | | | | | | |
| WSCC | ARIZONA PUBLIC SERVICE CO | CHOLLA NO 5 | I | T | Coal | 340 | 1995 |
| WSCC | +ARIZONA PUBLIC SERVICE CO | PALO VERDE NO 1 | I | N | | 1,270 | 1985 |
| WSCC | +ARIZONA PUBLIC SERVICE CO | PALO VERDE NO 2 | I | N | | 1,270 | 1986 |
| WSCC | +ARIZONA PUBLIC SERVICE CO | PALO VERDE NO 3 | I | N | | 1,270 | 1987 |
| WSCC | CALIFORNIA DEPT OF WATER RESOURCES | ALAMO NO 1 | SL | H | | 17 | 1985 |
| WSCC | CALIFORNIA DEPT OF WATER RESOURCES | BOTTLE ROCK | SL | T | Geothermal | 55 | 1985 |
| WSCC | CALIFORNIA DEPT OF WATER RESOURCES | SOUTH GEYSERS | SL | T | Geothermal | 55 | 1986 |
| WSCC | oCOLORADO-UTE ELECTRIC ASSOCIATION | NUCLA NO 4 | C | T | Coal | 64 | 1990 |
| WSCC | oCP NATIONAL CORP | SOLAR NO 2 | I | T | Solar | 30 | 1985 |
| WSCC | DESERET G & T COOP | BONANZA NO 1 | C | T | Coal | 400 | 1985 |
| WSCC | GRANT COUNTY PUB UTILITY DISTRICT | QUINCY CHUTE | SL | H | | 9 | 1985 |

| REGION | S Y S T E M | U N I T | OWNER-SHIP | TYPE | FOSSIL FUELS | MW of NET EXPECTED CAPABILITY | SKED YEAR OPTN |
|---|---|---|---|---|---|---|---|
| WSCC | +LOS ANGELES CALIFORNIA | INTERMOUNTAIN NO 1 | M | T | Coal | 761 | 1986 |
| WSCC | +LOS ANGELES CALIFORNIA | INTERMOUNTAIN NO 2 | M | T | Coal | 761 | 1987 |
| WSCC | METROPOLITAN WATER DISTRICT | RED MOUNTAIN NO 1 | M | H | | 6 | 1985 |
| WSCC | METROPOLITAN WATER DISTRICT | VALLEY VIEW NO 1 | M | H | | 4 | 1985 |
| WSCC | +MONTANA POWER COMPANY | COLSTRIP NO 4 | I | T | Coal | 700 | 1986 |
| WSCC | NORTHERN CALIFORNIA POWER AGENCY | GEOTHERMAL NO 3 | SL | T | Geothermal | 110 | 1985 |
| WSCC | PACIFIC GAS & ELECTRIC CO | DIABLO CANYON NO 1 | I | N | | 1,086 | 1985 |
| WSCC | PACIFIC GAS & ELECTRIC CO | DIABLO CANYON NO 2 | I | N | | 1,119 | 1985 |
| WSCC | PACIFIC GAS & ELECTRIC CO | GEYSERS NO 16 | I | T | Geothermal | 110 | 1985 |
| WSCC | PACIFIC GAS & ELECTRIC CO | GEYSERS NO 20 | I | T | Geothermal | 110 | 1985 |
| WSCC | PUBLIC SERVICE CO OF COLORADO | PAWNEE NO 2 | I | T | Coal | 485 | 1991 |
| WSCC | +PUBLIC SERVICE CO OF NEW MEXICO | NEW MEX STATION NO 1 | I | T | Coal | 500 | 1995 |
| WSCC | PUBLIC SERVICE CO OF NEW MEXICO | NEW MEX STATION NO 2 | I | T | Coal | 500 | 1996 |
| WSCC | PUBLIC SERVICE CO OF NEW MEXICO | NEW MEX STATION NO 3 | I | T | Coal | 500 | 1997 |
| WSCC | PUBLIC SERVICE CO OF NEW MEXICO | NEW MEX STATION NO 4 | I | T | Coal | 500 | 1998 |
| WSCC | SACRAMENTO CALIFORNIA | JONES FORK | M | H | | 10 | 1986 |
| WSCC | SACRAMENTO CALIFORNIA | McCLELLAN CT NO 1 | M | G | | 50 | 1985 |
| WSCC | SALT RIVER POWER DISTRICT | CORONADO NO 3 | SL | T | Coal | 350 | 1991 |
| WSCC | SAN DIEGO GAS & ELECTRIC CO | HEBER NO 2 | I | T | Geothermal | 45 | 1988 |
| WSCC | SEATTLE WASHINGTON | BOUNDARY NO 55 | M | H | | 196 | 1985 |
| WSCC | SEATTLE WASHINGTON | BOUNDARY NO 56 | M | H | | 196 | 1986 |
| WSCC | +SIERRA PACIFIC POWER CO | VALMY NO 2 | I | T | Coal | 250 | 1985 |
| WSCC | SOUTHERN CALIFORNIA EDISON CO | BALSAM MEADOW NO 1 | I | R | | 200 | 1988 |
| WSCC | SOUTHERN CALIFORNIA EDISON CO | SOLAR ONE | I | T | Solar | 10 | 1985 |
| WSCC | TACOMA WASHINGTON | MAIN CANAL HEADWORKS | M | H | | 22 | 1986 |
| WSCC | +TACOMA WASHINGTON | SUMMER FALLS NO 1 | M | H | | 47 | 1985 |
| WSCC | +TACOMA WASHINGTON | SUMMER FALLS NO 2 | M | H | | 47 | 1985 |
| WSCC | TUCSON ELECTRIC POWER CO | SPRINGERVILLE NO 1 | I | T | Coal | 330 | 1985 |
| WSCC | TUCSON ELECTRIC POWER CO | SPRINGERVILLE NO 2 | I | T | Coal | 330 | 1989 |
| WSCC | UTAH POWER & LIGHT CO | BLUNDELL NO 2 | I | T | Geothermal | 14 | 1987 |
| WSCC | +WASHINGTON PUB PWR SPLY SYSTEM | WNP NO 1 | SL | N | | 1,250 | 1993 |
| WSCC | +WASHINGTON PUB PWR SPLY SYSTEM | WNP NO 3 | SL | N | | 1,240 | 1992 |
| 43 | | | | | | | |
| ----- | | | | | 160 units: | 90,388 MW | |

# PART III—MANUFACTURE OF HEAVY ELECTRIC POWER EQUIPMENT

## (HISTORICAL AND SCHEDULED)

Data in this section of the report relate to the manufacture in the United States of heavy electric power equipment for U.S. electric power systems, U.S. Industrials and for export to customers outside of the United States. Information is also included on actual and scheduled imports of such equipment by U.S. electric power systems.

Orders placed with domestic and foreign manufacturers during 1984 for heavy electric power equipment by U.S. electric power systems are shown in the accompanying order synopsis table (Table 18), together with corresponding information for the previous four years.

Detailed data, as of January 1, 1985, concerning 1984 orders, shipments, scheduled shipments, and total production backlogs of domestic manufacturers for the three customer classes are shown in the series of tables that follow, along with analogous information on imports of certain types of equipment by U.S. electric power systems only.

During 1984, orders for new electric generating units, steam and hydraulic, placed with domestic manufacturers totaled 30 machines aggregating 1,678 megawatts. U.S. electric power systems accounted for 43.5 percent of this total capacity. The only orders placed in 1984 with foreign manufacturers by U.S. electric power systems were for two steam turbine-generators aggregating 122 megawatts.

Production by domestic manufacturers during the year 1984 amounted to 11.0 thousand megawatts, of which 7.3 thousand megawatts were delivered to U.S. electric power systems. The total production scheduled as of January 1, 1985, for all classes of customers amounts to 129 units totaling 55.1 thousand megawatts. The manufacturing schedule for 1985 totals 6.5 thousand megawatts. The 1986 and later schedule, up to now, calls for the production of 88 units totaling 48.6 thousand megawatts.

## Table 18/CAPACITIES OF VARIOUS TYPES OF EQUIPMENT ORDERED BY U.S. ELECTRIC POWER SYSTEMS FROM DOMESTIC AND FOREIGN MANUFACTURERS

| | | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|---|
| Electric Generating Units (4,000 kW and Larger) | | | | | | |
| Steam Turbine-Generators, kW | | | | | | |
| Conventional | | 2,846,000 (a) | 7,324,394 (a) | – | 591,465 | 683,100 |
| Nuclear | | – | – | – | – | – |
| Geothermal, kW | | – | 380,100 | 93,500 | 110,000 | 139,240 (a) |
| Solar, kW | | – | – | – | 14,700 | 30,000 |
| Combustion Turbine-Generators, kW | | 551,190 | 524,580 | 35,790 | 75,000 (a) | 75,800 |
| Generators for Hydraulic Turbines, kW | | 15,010 | 209,340 (a) | 279,326 (a) | 869,367 (a) | – |
| | TOTALS | 3,412,200 (a) | 8,438,414 (a) | 408,616 (a) | 1,660,532 (a) | 928,140 (a) |
| Steam Generators, 1,000 Lb Steam Per Hour | | 34,363 | 51,880 | 1,000 | 4,700 | 3,900 |
| Nuclear Power Reactors (50,000 kWe and Larger) | | – | – | – | – | – |
| Hydraulic Turbines, Hp | | 17,600 | 40,000 | – | – | – |
| Power Transformers, mVA (b) | | 123,037 | 91,093 | 78,003 | 69,495 | 65,688 |

(a) Includes equipment on order with foreign manufacturers.
(b) Includes U.S. Industrials.

# Table 19/MANUFACTURE OF ELECTRIC GENERATING EQUIPMENT— STEAM AND HYDRAULIC UNITS* (4,000 kW and Larger)

| Customer | Shipped | Scheduled as of January 1, 1985 | | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked |
|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 and Later | | 1984 |
| U.S. Electric Power Systems | | | | | |
| Units | 20 | 8 | 74 | 82 | 5 |
| kW | 7,273,585 | 3,809,167 | 45,748,134 | 49,557,301 | 730,100 |
| U.S. Industrials | | | | | |
| Units | 16 | 27 | 9 | 36 | 24 |
| kW | 518,999 | 676,650 | 488,425 | 1,165,075 | 797,650 |
| Exports from U.S. | | | | | |
| Units | 7 | 6 | 5 | 11 | 1 |
| kW | 3,235,574 | 1,968,496 | 2,410,496 | 4,378,992 | 150,000 |
| Total | | | | | |
| Units | 43 | 41 | 88 | 129 | 30 |
| kW | 11,028,158 | 6,454,313 | 48,647,055 | 55,101,368 | 1,677,750 |

* Does not include combustion turbine-generators, but does include steam turbine-generators for nuclear power plants.

# Table 20/MANUFACTURE OF STEAM TURBINE-GENERATORS (4,000 kW and Larger)

| Customer | Shipped | Scheduled as of January 1, 1985 | | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked |
|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 and Later | | 1984 |
| U.S. Electric Power Systems | | | | | |
| Units | 13 | 8 | 74 | 82 | 5 |
| kW | 7,047,268 | 3,809,167 | 45,748,134 | 49,557,301 | 730,100 |
| U.S. Industrials | | | | | |
| Units | 16 | 27 | 9 | 36 | 24 |
| kW | 518,999 | 676,650 | 488,425 | 1,165,075 | 797,650 |
| Exports from U.S. | | | | | |
| Units | 7 | 6 | 5 | 11 | 1 |
| kW | 3,235,574 | 1,968,496 | 2,410,496 | 4,378,992 | 150,000 |
| Total | | | | | |
| Units | 36 | 41 | 88 | 129 | 30 |
| kW | 10,801,841 | 6,454,313 | 48,647,055 | 55,101,368 | 1,677,750 |

# Table 20-A/MANUFACTURE OF CONVENTIONAL STEAM TURBINE-GENERATORS (4,000 kW and Larger) (Included in Table 20)

| Customer | Shipped 1984 | Scheduled as of January 1, 1985: 1985 | Scheduled as of January 1, 1985: 1986 and Later | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked 1984 |
|---|---|---|---|---|---|
| U.S. Electric Power Systems | | | | | |
| Units | 12 | 8 | 69 | 77 | 5 |
| kW | 5,887,268 | 3,809,167 | 40,484,156 | 44,293,323 | 730,100 |
| U.S. Industrials | | | | | |
| Units | 16 | 27 | 9 | 36 | 24 |
| kW | 518,999 | 676,650 | 488,425 | 1,165,075 | 797,650 |
| Exports from U.S. | | | | | |
| Units | 7 | 5 | 4 | 9 | 1 |
| kW | 3,235,574 | 1,262,000 | 1,704,000 | 2,966,000 | 150,000 |
| Total | | | | | |
| Units | 35 | 40 | 82 | 122 | 30 |
| kW | 9,641,841 | 5,747,817 | 42,676,581 | 48,424,398 | 1,677,750 |
| U.S.E.P.S. Orders to Foreign Manufacturers (Imports) | | | | | |
| Units | 3 | – | 5 | 5 | 2 |
| kW | 698,100 | – | 1,679,240 | 1,679,240 | 122,240 |

# Table 20-B/MANUFACTURE OF NUCLEAR STEAM TURBINE-GENERATORS (50,000 kWe and Larger) (Included in Table 20)

| Customer | Shipped 1984 | Scheduled as of January 1, 1985: 1985 | Scheduled as of January 1, 1985: 1986 and Later | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked 1984 |
|---|---|---|---|---|---|
| U.S. Electric Power Systems | | | | | |
| Units | 1 | – | 5 | 5 | – |
| kW | 1,160,000 | – | 5,263,978 | 5,263,978 | – |
| U.S. Industrials | | | | | |
| Units | – | – | – | – | – |
| kW | – | – | – | – | – |
| Exports from U.S. | | | | | |
| Units | – | 1 | 1 | 2 | – |
| kW | – | 706,496 | 706,496 | 1,412,992 | – |
| Total | | | | | |
| Units | 1 | 1 | 6 | 7 | – |
| kW | 1,160,000 | 706,496 | 5,970,474 | 6,676,970 | – |
| U.S.E.P.S. Orders to Foreign Manufacturers (Imports) | | | | | |
| Units | – | – | – | – | – |
| kW | – | – | – | – | – |

# Table 21/MANUFACTURE OF GENERATORS FOR HYDRAULIC TURBINES* (4,000 kW and Larger)

| Customer | Shipped 1984 | Scheduled as of January 1, 1985: 1985 | Scheduled as of January 1, 1985: 1986 and Later | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked 1984 |
|---|---|---|---|---|---|
| U.S. Electric Power Systems | | | | | |
| Units | 7 | – | – | – | – |
| kW | 226,317 | – | – | – | – |
| U.S. Industrials | | | | | |
| Units | – | – | – | – | – |
| kW | – | – | – | – | – |
| Exports from U.S. | | | | | |
| Units | – | – | – | – | – |
| kW | – | – | – | – | – |
| Total | | | | | |
| Units | 7 | – | – | – | – |
| kW | 226,317 | – | – | – | – |
| U.S.E.P.S. Orders to Foreign Manufacturers (Imports) | | | | | |
| Units | 6 | 3 | 8 | 11 | – |
| kW | 597,500 | 101,250 | 2,174,600 | 2,275,850 | – |

*Includes generators for pumped-storage plants

# Table 22/MANUFACTURE OF CONVENTIONAL STEAM GENERATORS (450 Psi Pressure and Higher)

| Customer | Shipped 1984 | Scheduled as of January 1, 1985: 1985 | Scheduled as of January 1, 1985: 1986 and Later | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked 1984 |
|---|---|---|---|---|---|
| U.S. Electric Power Systems | | | | | |
| Units | 9 | 6 | 19 | 25 | 1 |
| M Lb/Hr | 45,521 | 28,644 | 98,763 | 127,407 | 3,900 |
| U.S. Industrials | | | | | |
| Units | 3 | 4 | – | 4 | 5 |
| M Lb/Hr | 1,646 | 718 | – | 718 | 2,018 |
| Exports from U.S. | | | | | |
| Units | 1 | 3 | 1 | 4 | 1 |
| M Lb/Hr | 4,579 | 9,496 | 3,748 | 13,244 | 1,169 |
| Total | | | | | |
| Units | 13 | 13 | 20 | 33 | 7 |
| M Lb/Hr | 48,746 | 38,858 | 102,511 | 141,369 | 7,087 |

# Table 23/MANUFACTURE OF HYDRAULIC TURBINES*
# (5,000 Horsepower and Larger)

| Customer | Shipped | Scheduled as of January 1, 1985 | | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked |
|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 and Later | | 1984 |
| U.S. Electric Power Systems | | | | | |
| Units | 7 | 6 | 4 | 10 | – |
| Hp | 1,777,180 | 770,000 | 1,380,000 | 2,150,000 | – |
| U.S. Industrials | | | | | |
| Units | – | – | – | – | – |
| Hp | – | – | – | – | – |
| Exports from U.S. | | | | | |
| Units | 3 | 2 | – | 2 | – |
| Hp | 503,600 | 183,600 | – | 183,600 | – |
| Total | | | | | |
| Units | 10 | 8 | 4 | 12 | – |
| Hp | 2,280,780 | 953,600 | 1,380,000 | 2,333,600 | – |
| U.S.E.P.S. Orders to Foreign Manufacturers (Imports) | | | | | |
| Units | – | – | – | – | – |
| Hp | – | – | – | – | – |

*Includes hydraulic turbines for pumped-storage plants

# Table 24/MANUFACTURE OF COMBUSTION TURBINE-GENERATORS
# (4,000 kW and Larger)

| Customer | Shipped | Scheduled as of January 1, 1985 | | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked |
|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 and Later | | 1984 |
| U.S. Electric Power Systems | | | | | |
| Units | 1 | – | – | – | 1 |
| kW | 75,800 | – | – | – | 75,800 |
| U.S. Industrials | | | | | |
| Units | 20 | 14 | – | 14 | 12 |
| kW | 1,360,640 | 894,500 | – | 894,500 | 709,300 |
| Exports from U.S. | | | | | |
| Units | 9 | 4 | – | 4 | 10 |
| kW | 569,300 | 293,000 | – | 293,000 | 674,800 |
| Total | | | | | |
| Units | 30 | 18 | – | 18 | 23 |
| kW | 2,005,740 | 1,187,500 | – | 1,187,500 | 1,459,900 |
| U.S.E.P.S. Orders to Foreign Manufacturers (Imports) | | | | | |
| Units | 1 | – | – | – | – |
| kW | 75,000 | – | – | – | – |

# Table 25/MANUFACTURE OF NUCLEAR REACTORS (50,000 kWe and Larger)

| Customer | Completed | Scheduled as of January 1, 1985 | | Total Scheduled for Completion as of 1-1-85 | New Orders Booked |
|---|---|---|---|---|---|
| | 1984 | 1985 | 1986 and Later | | 1984 |
| U.S. Electric Power Systems | | | | | |
| Units | 3 | 15 | 55 | 70 | — |
| kWe | 3,140,000 | 16,852,000 | 61,672,000 | 78,524,000 | — |
| Exports from U.S. | | | | | |
| Units | 3 | 9 | 20 | 29 | — |
| kWe | 2,424,000 | 7,346,000 | 18,432,000 | 25,778,000 | — |
| Total | | | | | |
| Units | 6 | 24 | 75 | 99 | — |
| kWe | 5,604,000 | 24,198,000 | 80,104,000 | 104,302,000 | — |

# Table 26/MANUFACTURE OF POWER TRANSFORMERS (501 kVA and Larger)

| Customer | | Shipped During 1984 | Scheduled as of January 1, 1985 | | | | | | | Total Scheduled for Shipment as of 1-1-85 | New Orders Booked During 1984 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 and Later | | |
| | | | | | | 501 to 10,000 kVA | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | (Units | 4,580 | 2,136 | 77 | 26 | 16 | 4 | 4 | 5 | 2,268 | 4,779 |
| | (mVA | 10,929 | 5,167 | 274 | 119 | 72 | 44 | 44 | 56 | 5,776 | 11,198 |
| Exports from U.S. | (Units | 34 | 87 | – | – | – | – | – | 5 | 92 | 149 |
| | (mVA | 165 | 252 | – | – | – | – | – | 12 | 264 | 373 |
| TOTAL | (Units | 4,614 | 2,223 | 77 | 26 | 16 | 4 | 4 | 10 | 2,360 | 4,928 |
| | (mVA | 11,094 | 5,419 | 274 | 119 | 72 | 44 | 44 | 68 | 6,041 | 11,571 |
| | | | | | | 10,001 to 30,000 kVA | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | (Units | 493 | 402 | 32 | 1 | – | – | – | 10 | 445 | 617 |
| | (mVA | 13,093 | 10,793 | 1,029 | 22 | – | – | – | 405 | 12,249 | 18,271 |
| Exports from U.S. | (Units | 13 | 8 | – | – | – | – | – | – | 8 | 18 |
| | (mVA | 374 | 204 | – | – | – | – | – | – | 204 | 472 |
| TOTAL | (Units | 506 | 410 | 32 | 1 | – | – | – | 10 | 453 | 635 |
| | (mVA | 13,467 | 10,997 | 1,029 | 22 | – | – | – | 405 | 12,453 | 18,743 |
| | | | | | | 30,001 to 100,000 kVA | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | (Units | 197 | 161 | 20 | 4 | 5 | 8 | 6 | 8 | 212 | 221 |
| | (mVA | 13,418 | 9,325 | 1,244 | 260 | 228 | 513 | 373 | 635 | 12,578 | 14,032 |
| Exports from U.S. | (Units | 3 | – | – | – | – | – | – | – | 0 | 2 |
| | (mVA | 182 | – | – | – | – | – | – | – | 0 | 139 |
| TOTAL | (Units | 200 | 161 | 20 | 4 | 5 | 8 | 6 | 8 | 212 | 223 |
| | (mVA | 13,600 | 9,325 | 1,244 | 260 | 228 | 513 | 373 | 635 | 12,578 | 14,171 |
| | | | | | | 100,000 kVA and Larger | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | (Units | 144 | 67 | 5 | 8 | 7 | 7 | 1 | 14 | 109 | 85 |
| | (mVA | 46,432 | 20,975 | 2,157 | 2,927 | 2,729 | 2,548 | 784 | 4,397 | 36,517 | 22,187 |
| Exports from U.S. | (Units | – | 1 | 2 | – | – | – | – | – | 3 | 1 |
| | (mVA | – | 217 | 434 | – | – | – | – | – | 651 | 125 |
| TOTAL | (Units | 144 | 68 | 7 | 8 | 7 | 7 | 1 | 14 | 112 | 86 |
| | (mVA | 46,432 | 21,192 | 2,591 | 2,927 | 2,729 | 2,548 | 784 | 4,397 | 37,168 | 22,312 |
| | | | | | | Total (501 kVA and Larger) | | | | | |
| U.S. Electric Power Systems and U.S. Industrials | (Units | 5,414 | 2,766 | 134 | 39 | 28 | 19 | 11 | 37 | 3,034 | 5,702 |
| | (mVA | 83,872 | 46,260 | 4,704 | 3,328 | 3,029 | 3,105 | 1,201 | 5,493 | 67,120 | 65,688 |
| Exports from U.S. | (Units | 50 | 96 | 2 | – | – | – | – | 5 | 103 | 170 |
| | (mVA | 721 | 673 | 434 | – | – | – | – | 12 | 1,119 | 1,109 |
| TOTAL | (Units | 5,464 | 2,862 | 136 | 39 | 28 | 19 | 11 | 42 | 3,137 | 5,872 |
| | (mVA | 84,593 | 46,933 | 5,138 | 3,328 | 3,029 | 3,105 | 1,201 | 5,505 | 68,240 | 66,797 |

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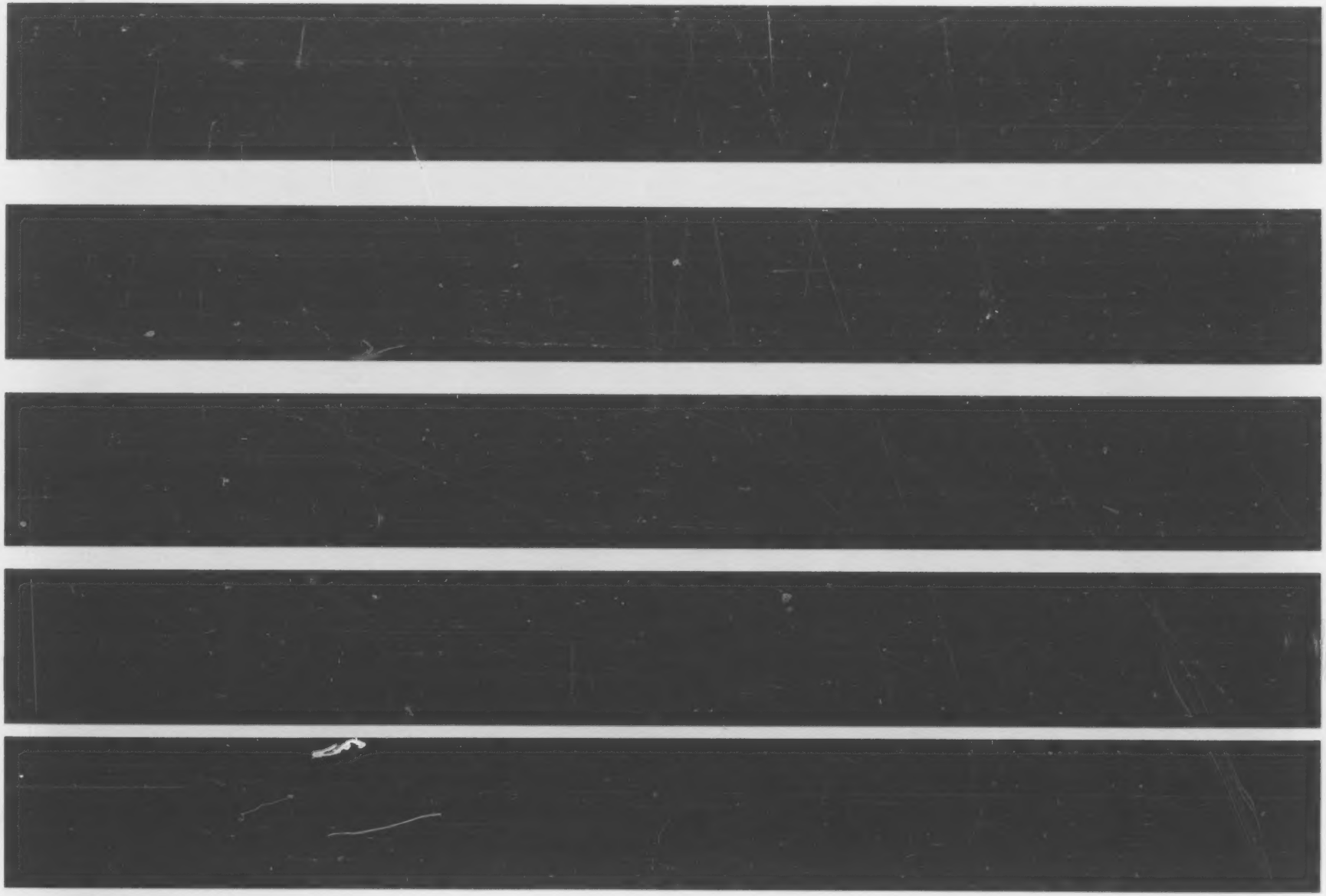

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